Vol. 1036 Number 1

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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November 1, 1983

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 1, 1983 Volume 1036 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Sept. 1983

Affirmed	195
Affirmed in Part	15
Reversed	64
Total	274

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,100,214, Re. S.N. 516,830, Filed July 25, 1983, Cl. 585/481, ISOMERIZATION OF MONOCYCLIC ALKYL AROMATIC HYDROCARBONS, Francis G. Dwyer, Owner of Record: *Mobil Oil Corp., New York, N.Y.,* Attorney or Agent: Alexander J. McKillop, Ex. Gp.: 116

4,182,486, Re. S.N. 487,631, Filed Apr. 22, 1983, Cl. 236/49, FLUIDIC FLOW SENSING AND CONTROL APPARATUS, Richard C. Mott, Owner of Record: *Honeywell, Inc., Minneapolis, Minn.,* Attorney or Agent: Stephen W. Buckingham, Ex. Gp.: 344

4,274,202, Re. S.N. 510,397, Filed June 30, 1983, Cl. 30/365, PERFORATING DEVICE, Detlef Petrick, Owner of Record: *Bonumwerke Tigges & Winckel GmbH & Co. KG, Langenberg, Germany,* Attorney or Agent: Michael J. Striker, Ex. Gp.: 323

4,320,224, Re. S.N. 498,116, Filed May 25, 1983, Cl. 528/125, THERMOPLASTIC AROMATIC POLYETHERKETONES, John Brewster Rose, et al., Owner of Record: *Imperial Chemical Industries Ltd., London, England,* Attorney or Agent: None, Ex. Gp.: 144

4,386,999, Re. S.N. 515,418, Filed July 20, 1983, Cl. 156/494, INERTIAL SPIN WELDING OF THERMOPLASTIC AND THERMOPLASTIC COATED CONTAINER PARTS, Vincent E. Fortuna, et al., Owner of Record: *Cosden Technology, Inc., Dallas, Tex.,* Attorney or Agent: Michael J. Caddell, Ex. Gp.: 161

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,523,464, Reexam. No. 90/000,448, Requested: Sept. 22, 1983, Cl. 74/552, STEERING WHEEL WITH PLASTIC FOAM SHEATHING, Henri Paul Marcel Quillery, et al., Owner of Record: *Inventor,* Ex. Gp.: 352, Requester: Sheller-Globe Corp., Toledo, Ohio

3,815,831, Reexam. No. 90/000,443, Requested: Sept. 12, 1983, Cl. 239/498, IRRIGATION SPRINKLERS, Abraham S. Jooste, Owner of Record: *Abraham S. Jooste, Cape Town, South Africa,* Attorney or Agent: John W. Malley, Ex. Gp.: 330, Requester: Microjet International, Inc., Dundee, Fla.

4,055,966, Reexam. No. 90/000,447, Requested: Sept. 19, 1983, Cl. 464/99, TORQUE TRANSMISSION COUPLING, Walter A. Fredericks, Owner of Record: *Rexnord, Inc., Milwaukee, Wis.,* Attorney or Agent: Robert H. Kelly, Ex. Gp.: 240, Requester: Owner

4,128,458, Reexam. No. 90/000,449, Requested: Sept. 26, 1983, Cl. 204/1T, COMBUSTIBLE ELEMENT AND OXYGEN CONCENTRATION SENSOR, Joseph O. Obiaya, Owner of Record: *Inventor,* Attorney or Agent: James T. Hoffman, Ex. Gp.: 112, Requester: Babcock & Wilcox Co. & Bailey Controls Co., Willowick, Ohio

4,156,999, Reexam. No. 90/000,452, Requested. Oct. 4, 1983, Cl. 52/376, BEAM FOR CONCRETE FORMING STRUCTURES, Peter J. Avery, Owner of Record: *Demiro Construction Ltd., Oniario, Canada,* Attorney or Agent: Donald E. Hewson, Ex. Gp.: 354, Requester: Structural Contours, Inc., Greenwich, Conn.

4,323,060, Reexam. No. 90/000,445, Requested: Sept. 16, 1983, Cl. 128/84, SPLINT, Jean-Claude R. Pecheux, Owner of Record: *Societe Anonyme Compagnie Generale de Materiel Orthopedique, Charleville-Mezieres, France,* Attorney or Agent: Bacon & Thomas, Ex. Gp.: 330, Requester: Biodynamic Technologies of Florida, Inc., Boca Raton, Fla.

Erratum

In the Official Gazette of Jan. 2, 1979 under TRADEMARK REGISTRATIONS CANCELED, Section 8, on page TM 56, "943,290. CRAZY SHIRTS AND DESIGN. U.S. Cl. 39." should be deleted.

XEROX LICENSE OFFER

This notice is published pursuant to a CONSENT ORDER TO CEASE AND DESIST dated July 29, 1975, as modified Sept. 10, 1982, between Xerox Corp. and the Federal Trade Commission.

TERMS *contained in this notice are defined in the Consent Order. All interested parties should refer to that document for the definitions and additional details of Xerox' patent and know-how licensing obligations thereunder.* A copy of the Consent Order and a list of PATENTS licensed to Xerox which are subject to the provisions of paragraphs II and IV (C) (9) of the Order, if any, are available from Xerox upon written request. All such requests and any request relating to the licensing of PATENTS pursuant to the Consent Order should be made in writing and addressed to:

The Manager of Patent Licensing
Xerox Corp.
P.O. Box 1600
Stamford, Conn. 06904

Xerox shall, in accordance with the terms of the Consent Order, grant licenses under

(a) its ORDER PATENTS to make, have made, use and vend OFFICE COPIER PRODUCTS under the terms of the Consent Order; and

(b) patents which are required to be licensed pursuant to the terms of paragraph X of the Consent Order, if any.

The following is a list of patents which is believed to include all of the PATENTS available for licensing in accordance with the terms of the Consent Order issued since the publication of the last notice by Xerox (1025 OG-6). Fuji Xerox, Ltd. patents which also make up part of the list are grouped separately. A copy of the classification index for the listed patents appears at 1012 OG-55. Since the classification system is not restricted solely to OFFICE COPIER PRODUCTS, there are several patents included in the list to which the Consent Order is not applicable.

FUJI XEROX PATENTS

CLASS 01A04

4,346,159.—PHOTOSENSITIVE ELEMENT FOR ELECTROPHOTOGRAPHY. Aug. 24, 1983.

CLASS: 01E

4,370,047.—HIGH SPEED COLOR APPARATUS. Jan. 25, 1983. CAN. 1,120,092, EPC. 4,736, FRA. 4,736, GER. 4,736, GRB. 4,736, HOL. 4,736.

CLASS: 05N

4,378,228.—PROCESS FOR PREPARATION OF MONODISPERSED CRYSTALLINE PARTICLES FROM AMORPHOURS POLYMERS. Mar. 29, 1983.

CLASS: 10A

4,350,332.—SHEET HANDLING APPARATUS. Sept. 21, 1982. GRB. 1,549,285.

CLASS: 15

4,346,156.—ELECTROPHOTOGRAPHIC-MAGNETIC DUPLEX IMAGING STRUCTURE AND METHOD. Aug. 24, 1982. CAN. 1,106,675, GRB. 1,581,361.

CLASS: 32

4,378,228.—PROCESS FOR PREPARATION OF MONODISPERSED CRYSTALLINE PARTICLES FROM AMORPHOURS POLYMERS. Mar. 29, 1983.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 1, 1983

D. 269,919	4,367,846	4,387,846	4,395,966
4,091,093	4,368,465	4,388,308	4,395,996
4,231,786	4,368,503	4,388,380	4,396,062
4,233,187	4,368,661	4,388,783	4,396,373
4,243,984	4,368,873	4,388,851	4,396,439
4,249,092	4,369,100	4,390,049	4,396,623
4,250,514	4,373,497	4,391,876	4,396,624
4,267,306	4,376,103	4,392,487	4,397,117
4,272,809	4,376,316	4,392,521	4,397,340
4,280,957	4,376,598	4,393,401	4,397,436
4,281,920	4,376,903	4,393,470	4,397,731
4,289,762	4,379,343	4,393,592	4,397,886
4,306,074	4,379,839	4,393,839	4,398,530
4,320,915	4,380,320	4,394,024	4,399,233
4,321,133	4,380,639	4,394,088	4,399,252
4,325,992	4,380,865	4,394,108	4,399,664
4,328,240	4,383,166	4,394,121	4,399,752
4,329,033	4,383,992	4,394,183	4,400,446
4,335,058	4,384,096	4,394,237	4,400,473
4,342,135	4,384,136	4,394,302	4,400,911
4,355,556	4,385,393	4,394,620	4,401,579
4,356,195	4,386,361	4,394,698	4,401,720
4,360,671	4,386,396	4,394,876	4,401,726
4,362,976	4,386,858	4,395,262	4,402,676
4,364,888	4,387,285	4,395,588	4,402,786
4,367,316	4,387,520	4,395,599	4,402,910
4,367,674	4,387,783	4,395,678	4,403,325

Disclaimers

3,996,153.—*Dieter Heeb,* and *Volker Bollert,* Hamburg, Germany. AEROSOL PROPELLANT. Patent dated Dec. 7, 1976. Disclaimer filed Sept. 14, 1983, by the assignee, *Hans Schwarzkopf, GmbH.*

Hereby enters this disclaimer to all claims of said patent.

4,296,359.—*Dennis L. Dodds,* Indianapolis, Ind. TELEVISION DISPLAY ERROR CORRECTION. Patent dated Oct. 20, 1981. Disclaimer filed Sept. 14, 1983, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1, 2, 3 and 5 of said patent.

Dedication

3,765,537.—*David J. Rosenberg,* Glen Cove, N.Y. DUAL BLOOD FILTER. Patent dated Oct. 16, 1973. Dedication filed Dec. 31, 1981, by the assignee, *Pall Corp.*

Hereby dedicates to the Public claims 1 through 17 of said patent.

Disclaimers and Dedications

3,560,704.—*John R. Albert,* Leawood, Kansas. ELECTRICALLY HEATED HAIR CURLER. Patent dated Feb. 2, 1971. Disclaimer and Dedication filed Dec. 23, 1982, by the assignee, *Dazey Products Co.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

4,285,858.—*Joseph H. Cort,* New York, N.Y. and *Alan Fischman,* New Haven, Conn. VASOPRESSIN ANALOGS. Patent dated Aug. 25, 1981. Disclaimer and Dedication filed July 18, 1983, by the assignee, *Mount Sinai School of Medicine of The City University of New York.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 1, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1968, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T103,601
PROCESS FOR PREPARATION OF MICROPOROUS MEMBRANES OF CONTROLLED FLOW CHARACTERISTICS

Ronald V. Repetti, 9 Marshall St., Old Greenwich, Conn. 06870

Continuation of Ser. No. 334,771, Dec. 28, 1981, abandoned, which is a continuation of Ser. No. 201,086, Nov. 27, 1980, abandoned. This application Dec. 3, 1982, Ser. No. 446,832

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—41

No Drawing. 25 Pages Specification

A dimensionally stabilized microporous polyamide membrane having enhanced flow characteristics comprised of a film forming organic polymeric material of low shrinkage prepared by drying the membrane, under conditions of restraint in the plane of the membrane to minimize the shrinkage until the membrane is essentially in a dried condition. A process is also described for preparing a microporous membrane designed to enhance incorporation and retention of a charge modifying resin for use as a charge modified filter media. The process comprises preparing a dope solution of a film forming polymer in a solvent system, directly casting the solution under the surface of a quenching medium comprising a non-solvent system for the polymer for a time sufficient to form micropores in the film, and drying the film while controlling the planar dimensions of the film during the drying.

The foregoing process is particularly useful in the preparation of a charge modified membrane of enhanced electrokinetic capture potential in the filtration of charged submicronic contaminants from aqueous liquids.

T103,602
ROTARY-TYPE CUTTER ELEMENT WITH MEANS FOR DISTRIBUTING WEAR

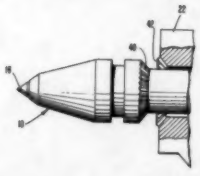
Gary H. Rettkowski, 112 Yeager Rd., Mountaintop, Pa. 18707

Filed Dec. 28, 1981, Ser. No. 334,637

Int. Cl.³ E21C *35/18*

U.S. Cl. 299—10

3 Sheets Drawing. 223 Pages Specification



A mining cutter comprises a plurality of holders mounted on a tool support, and a cutting element mounted in a socket of each holder. The tool support is driven such that the cutting elements are alternately moved into cutting and non-cutting modes relative to an earth formation. A retainer rotatably retains each cutting element in its associated socket for limited longitudinal forward movement relative to the holder toward the non-cutting mode and limited longitudinal rearward movement toward the cutting mode. Each cutting element and holder includes mutually engageable surfaces for preventing rotation of the cutting element in the cutting mode while permitting rotation of the cutting element in the non-cutting mode. The arrangement may be such that rotary movement of the cutter element is induced as the cutter element travels toward its cutting mode and/or toward its non-cutting mode.

T103,603
PROCESS AND APPARATUS FOR PREPARING SILVER HALIDE EMULSIONS

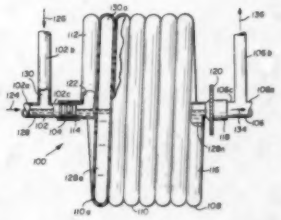
Jeffrey S. Baugher; Douglas L. Oehlbeck, and Barry M. Brown, all of Kodak Park, Rochester, N.Y. 14650

Filed Dec. 6, 1982, Ser. No. 447,378

Int. Cl.³ G03C *1/02*; B01F *15/02, 9/00*

U.S. Cl. 430—569

1 Sheets Drawing. 16 Pages Specification



A process is disclosed for preparing a silver halide emulsion comprised of serially receiving a silver halide emulsion at an upstream location, supplying the silver halide emulsion in a further prepared form at a downstream location, and transporting the silver halide emulsion between the upstream and downstream locations while it is being further prepared. The silver halide emulsion is divided into discrete segments as it is received at the upstream location. The discrete segments of the silver halide emulsion are transported between the upstream and downstream locations in the sequence of their formation. The emulsion can be finished as it is transported to the downstream location. The silver halide grains can be shelled during transport. In still another application a converted-halide emulsion can be formed during transport to the downstream location. An apparatus for the preparation of the silver halide emulsion is comprised of a tubular helix capable of being oriented so that its longitudinal axis is substantially horizontal. The tubular helix defines an inlet and an outlet. Means are provided for rotating the tubular helix about its longitudinal axis, and means are provided for supplying silver halide emulsion to the inlet of said tubular helix when the inlet lies below the longitudinal axis.

REISSUES

NOVEMBER 1, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,432

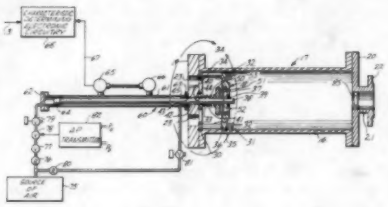
APPARATUS AND METHOD FOR DETERMINING THE CHARACTERISTIC OF A FLOWMETER

Edward E. Francisco, Jr., Paradise Valley, Ariz., assignor to Flow Technology, Inc., Phoenix, Ariz.

Original No. 4,152,922, dated May 8, 1979, Ser. No. 907,681, May 19, 1978. Continuation of Ser. No. 177,448, Aug. 11, 1980, abandoned. Application for reissue Nov. 2, 1981, Ser. No. 316,992

Int. Cl.[3] **G01F** *25/00*

U.S. Cl. 73—3 **51 Claims**



26. A method for proving a flowmeter connected in a fluid line, the method comprising the steps of:

connecting a measuring cylinder in the fluid line, the measuring cylinder having a piston movable through the cylinder between an upstream position near one end of the cylinder and a downstream position near the other end of the cylinder;

connecting a normally open valve in the line to prevent flow past the piston when the valve is closed, thereby driving the piston through the cylinder;

setting the piston at the upstream position;

closing the valve temporarily to drive the piston to the downstream position in synchronism with fluid flow through the line;

opening the valve when the piston reaches the downstream position; and

maintaining the pressure difference across the piston constant during its movement from the upstream position to the downstream position so as to suppress perturbations in the fluid line.

Re. 31,433

VARIABLE TOOTH SAW BLADE

Calvin M. Clark, Bernardston, Mass., assignor to Capewell Manufacturing Company, Hartford, Conn.

Original No. 4,179,967, dated Dec. 25, 1979, Ser. No. 937,549, Aug. 28, 1978. Application for reissue Oct. 16, 1981, Ser. No. 312,360

Int. Cl.[3] **B23D** *61/12;* **B27B** *33/02*

U.S. Cl. 83—846 **13 Claims**

11. A saw blade having a toothed edge comprising a plurality of recurrent groups of teeth with each group including a series of teeth which are set angularly and alternately sidewise the same amount, which have their tips in substantial alignment and which have varying gullet depths and varying pitch and varying rake angles and with the teeth changing gradually in gullet depth, the pitch distance between each pair of teeth increasing with gullet depth and each tooth of lesser gullet depth having a more positive rake angle than a tooth of greater gullet depth.

Re. 31,434

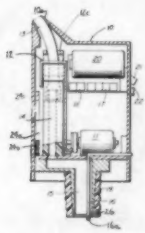
PORTABLE LIQUID METERING DEVICE

David H. Reilly, Fort Lauderdale, Fla., assignor to Electro Data Systems, Inc., Fort Lauderdale, Fla.

Original No. 4,265,370, dated May 5, 1981, Ser. No. 22,984, Mar. 22, 1979. Application for reissue May 3, 1982, Ser. No. 374,021

Int. Cl.[3] **B67D** *5/30*

U.S. Cl. 222—25 **5 Claims**



1. A self-contained portable liquid metering and dispensing device comprising: a housing (**10**) having upper pouring means (**10a**) and lower inlet means (**19**) for detachably securing *the housing* to the opening of a liquid container; air means (**16**) extending through said housing into said lower means (**19**); conduit means connecting said pouring and lower means and including a flexible resilient portion (**13**), means (**12a**) for pinching off flow in said resilient portion (**13**), a reverse polarity motor means (**11**) connected to and actuating said pinching means (**12a**); power means (**20**) for actuating said motor means (**11**); [movable magnet means (**24b**) moved by tipping of the device; switch means (**24**) actuated by said magnet means (**24g**)]; *switch means (24) actuable by tipping of the device;* logic means (**100**) actuated by said switch means (**24**) to cause said motor means to rotate to release said pinching means (**12a**) from said resilient portion (**13**), stop rotation for a predetermined period of time and then rotate on reverse to pinch off said resilient portion (**13**); and means (**17**) for counting and displaying the number of actuations of said switch means (**24**); all of said means being carried completely by said housing.

Re. 31,435

TELESCOPIC CARTON ASSEMBLY

Raymond A. Gillie, Walnut Creek, Calif., assignor to Arvey Corporation, Chicago, Ill.

Original No. 4,323,187, dated Apr. 6, 1982, Ser. No. 896,797, Apr. 17, 1978. Application for reissue Sep. 30, 1982, Ser. No. 431,825

Int. Cl.[3] **B65D** *5/22, 5/30, 5/68*

U.S. Cl. 229—34 R **17 Claims**

11. A carton forming a separate, self-contained, coverage shipping container which is adapted to be converted into part of a telescopic carton assembly, comprising:

an outer panel providing a bottom for said separate, self-contained, covered shipping container;

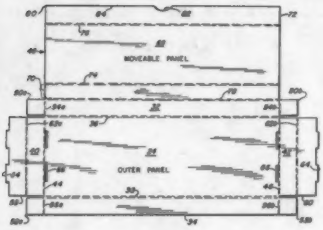
upright walls extending generally upwardly around said outer panel, and a movable flap assembly integrally hinged to and

extending from one of said upright walls for converting said carton from use as a separate, self-contained, covered shipping container to use as part of a telescopic carton assembly;

said movable flap assembly including a movable panel and first and second pivotable flaps which are respectively integrally hinged to and extend along generally opposite edges of said movable panel;

said movable panel and said first pivotable flap together being about the same dimensions as said outer panel as viewed from the interior of the carton so as to define the top portion of said separate, self-contained, covered shipping container; and

said movable panel and said second pivotable flap having dimensions no greater than said outer panel and being movable together for engaging said outer panel within the interior of said carton so as to define an interior reinforcement section during use of said carton as part of said telescopic carton assembly.



Re. 31,436
THERMOSETTING POLYESTER COMPOSITION CONTAINING NORMALLY SOLID CARBOXY-CONTAINING DIENE POLYMER

Aubrey South, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 4,020,036, dated Apr. 26, 1977, Ser. No. 679,284, Apr. 22, 1976. Application for reissue Jul. 8, 1977, Ser. No. 814,066

Int. Cl.[3] **C08L** *67/06*

U.S. Cl. 523—514 **16 Claims**

1. A *cured thermoset article produced by subjecting to heat a thermosetting* composition comprising:

a. an unsaturated polyester prepared by reacting an unsaturated dicarboxylic acid and a polyol;

b. *a diene component consisting essentially of* a normally solid carboxy-containing polymer of a conjugated diene having a weight average molecular weight within the range of [30,000] *50,000* to [400,000] *250,000 and wherein said carboxy-containing polymer has a polymerized conjugated diene content of from 55 to 100 weight percent;*

c. a vinyl monomer;

d. a catalyst; and

e. [at least one of] a *fibrous* reinforcing agent [or a filler].

Re. 31,437
RESISTANCE MATERIAL

Alexander H. Boonstra; Cornelis A. H. A. Mutsaers, and Franciscus N. G. R. van der Kruijs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Original No. 4,277,542, dated Jul. 7, 1981, Ser. No. 74,598, Sep. 12, 1979. Application for reissue Jul. 16, 1982, Ser. No. 399,052

Claims priority, application Netherlands, Sep. 20, 1978, 7809554

Int. Cl.[3] **B32B** *15/00*

U.S. Cl. 338—308 **8 Claims**

1. A resistance material consisting essentially of a mixture of [at least one metal oxidic compound], a permanent binder and a temporary binder, [at least one metal oxide] and, as a resistance determining component, a barium-rhodate of the formula $BaRh_6O_{12}$.

PLANT PATENTS

GRANTED NOVEMBER 1, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,129

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "OPTIMARA", Isselburg, Fed. Rep. of Germany

Filed Sep. 9, 1981, Ser. No. 300,518
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Nebraska, and particularly characterized as to uniqueness by the combined features of semi-double to double orchid purple blossoms with heavily frilled and partly to totally white edges; 7–9 slightly tilted flower stems, each of which contains eleven or more flowers; uniform growth; saleability with loose corolla within 10 weeks after potting, and its long lasting and non-dropping petals.

5,130

ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Dec. 10, 1981, Ser. No. 329,195
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class, substantially as shown and described, characterized particularly by very fragrant Neyron rose flowers which open fully and are borne primarily singly or in small clusters on a vigorous plant with abundant foliage.

5,131

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,078
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant, known by the cultivar name Solared, as described and illustrated, and particularly characterized as to uniqueness by its brilliant scarlet flowers, high floriferousness, early blooming and continuous flowering until frost, superior self-branching and compact, mounded growth habit, variegated dark green foliage, resistance to fading, and by its adaptability to various use environments.

5,132

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,079
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens known by the cultivar name Gemini, as disclosed and illustrated, and particularly characterized by its clear bright pink flower color and contrasting dark green variegated foliage; highly floriferous habit; firm petal texture, relatively large flowers, with distinct deep pink to red throat; continuous flowering and highly stable flower color, with little fading in summer, and by its semi-procumbent and weather resistant habits which make it ideal for baskets and bedding plants.

PATENTS

GRANTED NOV. 1, 1983

ERRATA

For CLASS	See PATENT NO.
101–347	4,412,496
604–415	4,412,573
383–048	4,412,645
502–423	4,412,937
502–115	4,412,939
502–209	4,412,940
377–025	4,413,175

PATENTS

GRANTED NOVEMBER 1, 1983

GENERAL AND MECHANICAL

4,412,357
SHIRT
Sally Mincher, 104 Live Oak Dr., Wrightsville Beach, N.C. 28480
Filed Dec. 29, 1980, Ser. No. 220,689
Int. Cl.³ A41B *1/18*
U.S. Cl. 2—118 **7 Claims**

1. An improved shirt for female athletes comprising: a shirt body for completely encircling and covering the torso of a female athlete from the waist up; said shirt body comprising permanently joined front and rear panels, said front panel comprising means for covering an athlete's breasts and abdomen and said rear panel comprising means for covering an athlete's back; and adjusting means attached to the exterior of said front panel for selectively and adjustably applying constraining forces to the breasts of an athlete wearing the shirt

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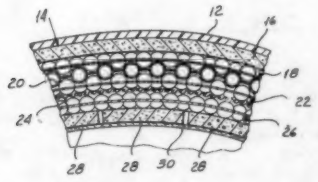
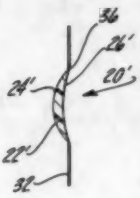
4,412,358
INDIVIDUALLY FITTED HELMET LINER AND METHOD OF MAKING SAME
Michael R. Lavender, Vandling, Pa., assignor to Gentex Corporation, Carbondale, Pa.
Continuation of Ser. No. 132,817, Mar. 24, 1980, abandoned. This application May 27, 1982, Ser. No. 382,420
Int. Cl.³ A42B *3/00*
U.S. Cl. 2—412 **13 Claims**



1. A helmet liner including in combination a plurality of layers conforming generally to the top of a wearer's head, said layers being assembled in superposed contacting relationship with one another and each comprising a sheet having spaced projections on at least one side thereof, said sheets being elastic at normal temperatures and plastically deformable at elevated temperatures to permit adjustment of the effective thickness of said liner.

4,412,359
POSTERIOR CHAMBER LENS IMPLANT
William D. Myers, 5855 Wingcroft Ct., Birmingham, Mich. 48011
Filed Apr. 26, 1982, Ser. No. 371,541
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **1 Claim**

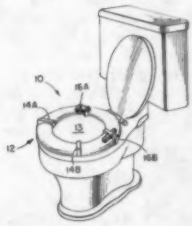


1. A posterior chamber lens implant for a human eye for use after extracapsular surgery in which a posterior capsule is left substantially intact, said lens implant comprising:

a substantially circular rigid optic having a front surface, a rear surface and a substantially circular and continuous outer rear edge, said front surface being a continuous convex surface and said rear surface being a continuous concavely curved surface extending between said outer rear edge,

means for securing said optic to the eye within the posterior chamber so that said outer rear edge abuts against the posterior capsule and so that the rear concavely curved surface of said optic is spaced from the posterior capsule by a distance sufficient to safely allow a subsequent laser posterior capsulotomy.

4,412,360
METHOD OF AND APPARATUS FOR PROVIDING A PERSONAL SANITARY TOILET SEAT COVER
Harold Levin, 725 Providence Rd., Charlotte, N.C. 28207
Filed Jun. 15, 1981, Ser. No. 273,863
Int. Cl.³ A47K *13/14*
U.S. Cl. 4—242 **10 Claims**



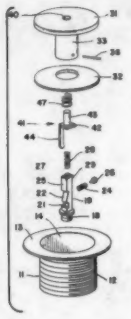
1. A toilet seat comprising:

(a) a base seat having an upper surface and an opening;

(b) mounting means attached to, and extending upwardly from, said base seat upper surface, said mounting means comprising at least two mounts, each of said mounts having its uppermost surface, substantially horizontal, said horizontal surfaces being located above the upper surface of said base seat, said upper horizontal surfaces lying in substantially the same plane above the plane of said base seat; and

(c) a protective cover adapted to be detachably mounted on said mounting means, said protective cover having a smooth upper surface and an opening corresponding to said base seat opening and means to cooperate with said mounts, whereby when said protective cover is mounted on said mounting means, the mounting means are covered by said cove and are not exposed to a user of said toilet seat.

4,412,361
BUTTON ACTUATED POP UP DRAIN FITTING
Casper Cuschera, 800 Durham Rd., Fremont, Calif. 94538
Filed Dec. 14, 1981, Ser. No. 330,718
Int. Cl.³ A47K 1/14
U.S. Cl. 4—286 **5 Claims**

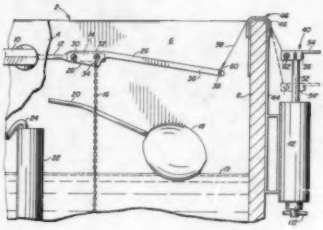


1. In a drain valve including a drain body having a flow channel therethrough and a post extending axially through said flow channel, and a drain sealing cover provided with a tubular portion having a central passage receiving said post for slidable translation thereabout and radial clearance therefrom, detent means in one axially extending surface of said post for selectively securing said post and said tubular portion with said drain sealing cover sealing said flow channel, and resilient means for biasing said cover upwardly to the open position, the improvement comprising button actuator means for releasing said detent means, said button actuator means including a button extending upwardly from said drain sealing cover and adapted to be manually depressed to release said detent means, said central passage comprising a rectangular bore extending axially in said tubular portion, and a rectangular groove formed in one wall of said rectangular bore, said button being disposed generally within said bore, said drain sealing cover including a hole extending therethrough to said rectangular bore, said button extending upwardly from said button actuator means and through said hole, said button actuator means further including an arm extending generally downwardly from and edge portion thereof, said arm being slidably received in said rectangular groove.

4,412,362
PARTIAL FLUSH APPARATUS UTILIZING PNEUMATIC TIME DELAY MECHANISM
Kenneth G. Nylund, Rte. 1, Box 40C, Globe, Ariz. 85501
Filed Jan. 15, 1981, Ser. No. 225,390
Int. Cl.³ E03D 1/34
U.S. Cl. 4—388 **14 Claims**

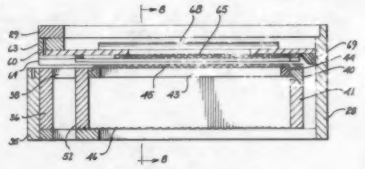
1. A partial flush apparatus for use in conjunction with a conventional toilet of the type having a water tank, a flapper valve mounted at the bottom of the water tank, a flush handle, a lever arm disposed within the water tank and having a first end connected to the flush handle and having a second end opposite the first end, and a first flexible linkage coupling the flapper valve to the second end of the lever arm for raising the flapper valve when the flush handle is operated, said partial flush apparatus comprising in combination:

a. pneumatic time delay means secured to said water tank substantially external therefrom, said pneumatic time delay means including a plunger slidingly extending therein and biased toward a released position, said plunger having an actuator operated by the user apart from said flush handle for depressing said plunger from the released position to a depressed position, said pneumatic time delay means retarding the return of said plunger from the depressed position to the released position for a predetermined time; and



b. coupling means for coupling the second end of said lever arm to said plunger in order to raise the second end of the lever arm for partially opening the flapper valve for the predetermined time whenever the user actuates said plunger, said coupling means including a second flexible linkage which is made taut when said plunger is depressed and which is slackened when said flush handle is operated for preventing said pneumatic time delay means from interfering with the normal operation of said lever arm when said flush handle is operated.

4,412,363
APPARATUS FOR COLLECTING AND DISTRIBUTING POLLEN
Charles H. Robson, 6241 S. 30th St., Phoenix, Ariz. 85040
Filed Aug. 7, 1981, Ser. No. 290,750
Int. Cl.³ A01K 47/06
U.S. Cl. 6—4 R **14 Claims**



12. Apparatus for collecting and distributing pollen, and for placement at different levels in a segmented bee colony, said apparatus comprising:

(a) a housing for insertion in a segmented bee colony and having a front wall;

(b) pollen collection means movably mounted in said housing for receiving pollen and bounding at least one vertical bee passageway adjacent thereto;

(c) reversible scraper means movably mounted in the front wall of said housing, said means being spaced from adjacent portions of said front wall and being positioned in overlying relationship to said bee passageway for removing the pollen from bees passing there through;

(d) a pollen tray mounted on one side of said scraper means and adjacently spaced thereto, the reversal of said scraper

means placing said pollen tray beneath said scraper means and above said collection means whereby pollen removed from the bees is retained on the pollen tray; and

(e) means for controlling access to said bee passageway.

4,412,364

PROCESS FOR THE NORMALIZED MANUFACTURE OF SHOES

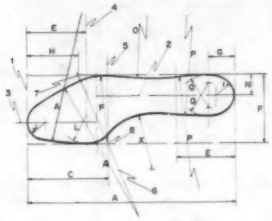
Fernando Orea Mateo, Edificio Torres Blancas, Avda. America, 37-945 Madrid, Spain

Filed Mar. 10, 1981, Ser. No. 242,254

Claims priority, application Spain, Mar. 18, 1980, 489.711

Int. Cl.³ A43D 3/00

U.S. Cl. 12—146 L **6 Claims**



1. A process for the normalized manufacture of shoes, such that as shoe lengths change, other shoe dimensions are changed proportionally, said process comprising contouring shoe lasts used for shoe manufacture such that for each shoe last the sole of the last is dimensioned by:

defining an axis extending transverse to the length of said sole of said last at a position spaced from the front of said sole by one-third the length of said sole;

defining four forward sole zones separated by three lines extending transverse to said length and spaced bewteen said front and said axis by equal intervals of 1/12 said length;

forming said sole at a first said transverse line closest to said front to have a straight contour along said first transverse line;

forming said sole at a second said transverse line rearwardly adjacent said first transverse line to have a regularly arched contour having a height of 1/120 of said length;

forming said sole at a third said transverse line closest to said axis to have a regularly arched contour having a height of 1/96 of said length;

defining eight rearward sole zones separated by seven rear lines extending transverse to said length and spaced between said axis and the heel of said sole by equal intervals of 1/12 said length;

forming said sole at a first said rear transverse line closest to said axis to have a regularly arched contour having a height of 1/96 of said length; and

forming said sole at each of the remainder of said rear transverse lines to have a regularly arched contour having a height of 1/60 of said length.

4,412,365

BRUSH

Wilhelm E. Schmitt, Le Grange Park, Ill., assignor to Jack S. Friedman, Highland Park, Ill.

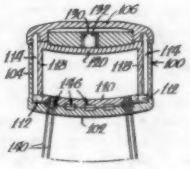
Continuation-in-part of Ser. No. 782,176, Mar. 28, 1977, abandoned, and Ser. No. 802,793, Jun. 2, 1977, abandoned, and Ser. No. 90,101, Nov. 1, 1979, abandoned. This application Aug. 19, 1981, Ser. No. 294,361

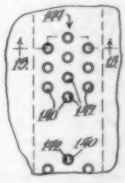
Int. Cl.³ A46B 7/00, 9/02, 17/06

U.S. Cl. 15—184 **26 Claims**

5. A brush comprising: a body having wall means defining an internal chamber, said walls means including a bottom wall having a plurality of openings therein establishing communication between said chamber and the exterior of said body, a bristle holder within the internal chamber of said body, a plurality of bristles carried by said bristle holder, each bristle being aligned with one of said openings, means for moving said bristle holder toward and away from said bottom wall to move said bristles between an operative position wherein the free ends of the bristles are disposed outwardly of the outer surface of said bottom wall to a retracted position wherein the free ends of the bristles are disposed at least at the level of the outer surface of said bottom wall, said bottom wall having an arcuate inner surface, said bristle holder having an arcuate outer surface adapted to be positioned in surface-to-surface contact with the arcuate inner surface of said bottom wall when said bristles are in the operative position, and recess means in both of said surfaces in alignment with said openings to prevent kinking of said bristles when said bristles are in the operative position.

25. A hair brush comprising: a generally rigid body having a bottom surface, a plurality of openings in said body extending upwardly of said bottom surface and generally perpendicularly thereto, said openings being arranged in plural rows of plural clusters of relatively closely spaced individual openings, a single slender elongate monofilament bristle of a given cross-





sectional configuration and flexibility extending through each of said openings, said bristles projecting outwardly of said bottom surface in an operative position and disposed substantially parallel with one another at least along the length of said brush, the ratio of the largest cross-sectional dimension of one of said bristles to the spacing between said one bristle and any closest other bristle being in an effective range that permits the coaction among

(a) bristle flexibility,

(b) bristle cross-sectional configuration and dimension,

(c) bristle projecting length, and

(d) spacing and pattern of said openings to collectively provide means for disposing the bristles in mutually supportive relationship with one another in said operative position when said bristles are flexed, a ratio of about 1:2 being in said effective range for a bristle having a circular cross-section with a diameter of 0.02 inch, said openings and said bristles having substantially the same cross-sectional configuration and dimensions and said openings being positioned in sufficiently closely spaced relationship to said bristles to define means for retaining the bristles of each cluster spaced from one another at least adjacent said bottom surface to prevent the formation of pressure points, and securement means for retaining each bristle within its opening.

4,412,366

ADJUSTABLE HINGE

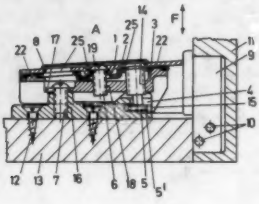
Erich Röck, Höchst, and Klaus Brüstle, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Feb. 26, 1981, Ser. No. 238,557

Claims priority, application Austria, Feb. 26, 1980, 1047/80; Dec. 1, 1980, 5848/80

Int. Cl.³ E05D 7/04

U.S. Cl. 16—236 11 Claims



1. A furniture hinge comprising:

a supporting member adapted to be mounted on a wall portion of an article of furniture;

a hinge arm adapted to be connected to a door of an article of furniture so that the door is pivotal with respect to the wall portion about a rotational axis, said hinge arm having a U-shaped cross-sectional configuration and a longitudinal center axis;

clamping screw means for clamping said hinge arm to said supporting member in an orientation such that said longitudinal center axis is adapted to extend transverse to the rotational axis, said clamping screw means being capable of being loosened so that the position of said hinge arm with respect to said supporting member is adjustable; and

guiding means, positioned between said hinge arm and said supporting member, for guiding adjusting movement of said hinge arm with respect to said supporting member in a direction parallel to the mounting plane of said supporting member and oblique to said longitudinal center axis without altering the orientation of said longitudinal center axis with respect to the rotational axis of said supporting member, said guiding means comprising a guiding member positioned within the U-shaped profile of said hinge arm, said guiding member and said supporting member having mutually abutting surfaces extending in directions inclined to said longitudinal center axis and parallel to said mounting plane.

4,412,367

ELECTRIC STOP MOTION APPARATUS FOR A TEXTILE MACHINE

Heinz Clement, and Christina Furrer, both of Winterthur, Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Apr. 6, 1981, Ser. No. 250,942

Claims priority, application Switzerland, Apr. 23, 1980, 3127/80

Int. Cl.³ D01G 31/00; B65H 25/14; D01H 13/16

U.S. Cl. 19—0.25 8 Claims

1. An electric stop motion apparatus for a textile machine which is fed with traveling fiber slivers, particularly a drawframe, wherein a respective pair of feed rolls are provided for each fibre sliver for feeding the fiber sliver in a predetermined direction of travel, comprising:

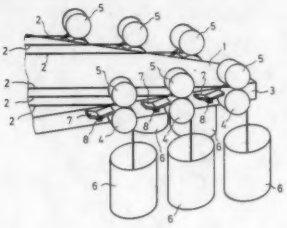
a respective tiltable pan provided for each infed fiber sliver;

means mounting each said tiltable pan for tilting movement between a working position and a stop position;

tilting of said tiltable pan being accomplished by depletion of the fiber sliver either upstream or downstream of the related pair of feed rolls with respect to said predetermined direction of travel of the sliver, in order to thus activate an electric stop motion contact upon depletion of the fiber sliver either upstream or downstream of said related pair of feed rolls;

said tiltable pan being arranged beneath the normally running fiber sliver without being in contact with said fiber sliver;

said mounting means for said tiltable pan defining a horizontal tilt axis arranged substantially perpendicular to the direction of travel of the fiber sliver;



stop means positioned to cooperate with said tiltable pan;

said tiltable pan possessing a mass distribution which is selected such that when the pan is in its working position it is maintained against said stop means through a self-holding action exerted by said tiltable pan; and

tilting of the pan into its working position being accomplished by overcoming the self-holding action of said tiltable pan through the application of an external force while the tiltable pan passes through an unstable neutral position.

4,412,368

SAFETY-PINS

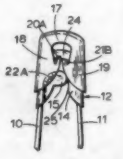
Paul H. Springer, West Midlands, England, assignor to Newey Goodman Limited, Birmingham, England

Filed Nov. 6, 1981, Ser. No. 318,698

Claims priority, application United Kingdom, Aug. 11, 1980, 8035950

Int. Cl.³ A44B 9/14

U.S. Cl. 24—158 9 Claims



9. Blocking means for preventing unintentional opening of a safety pin of the type having a first limb to one end of which is affixed a cap having a recess opening in the direction of that limb and a second limb is received and resiliently retained within the recess within said cap said cap being so shaped as to permit said end portion of the second limb to enter the recess from either side of the cap at will, said cap including a tongue projecting into or close to the mouth of the recess from a part of the cap facing the recess, said sheath comprising a top portion of inverted channel shape, a first end portion depending from one end of the top portion, and a second end portion depending from the other end of the top portion, the two end portions each being of channel-like shape, with the channels opening towards each other, each said end portion having two lugs, one on each face of each said end portion, and two de-

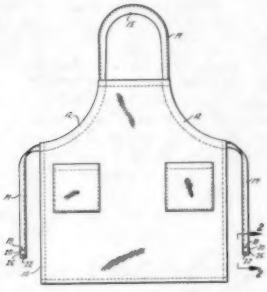
formable parts, one on each face of each said end portion, the two lugs on that end portion adjacent to the recess of said cap being bent inwards to form restraining means, and the deformable parts on the end portion adjacent to the base of said tongue being pinched inwards to form restraining means, said lugs and said deformable parts being located on said sheath that two of said lugs and two of said deformable parts are always located for said bending and pinching respectively regardless of the initial orientation of said sheath relative to said cap.

4,412,369

HOOK-LIKE END FOR DRAWSTRING

Arturo A. Carnaghi, St. Louis, Mo., assignor to Angelica Corporation, St. Louis, Mo.

Filed Jun. 11, 1982, Ser. No. 387,695
Int. Cl.³ A41F *1/00*; A41D *13/04*
U.S. Cl. 24—266 **4 Claims**



4. A drawstring which comprises a first portion that is disposed within a first tubular passage, a second portion that is disposed within a second tubular passage which is spaced away from said first tubular passage, and a third portion that spans the space between said tubular passages, said third portion having a wide section therein which is substantially wider than the internal width of either of said tubular passages, said wide section resisting accidental movement of said third portion into either of said tubular passages and also resisting accidental telescoping of said tubular passages over said wide section, said wide section being bendable in transverse section to permit said third portion to be moved into either of said tubular passages, said third portion having a tapered section intermediate said wide section and one of said tubular passages, and said third portion being made of flexible and yieldable material and being bendable in transverse section to permit said tapered section of said third portion to enter said one of said tubular passages, but the resistance of said third portion to bending in transverse section enabling said third portion to resist but not prevent telescoping of said one tubular passage over said tapered section and thereafter to resist but not prevent movement of said third portion relative to said one tubular passage, said tapered section of said third portion being free of abrupt width-reducing steps which could prevent movement of said tapered section of said third portion into said one tubular passage.

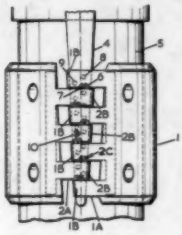
4,412,370

CLAMPS

Graeme K. Speirs, Redridge Cottage, Den of Cults, Aberdeen, Scotland

Filed Jun. 21, 1982, Ser. No. 390,368
Claims priority, application United Kingdom, Jun. 19, 1981, 8118901
Int. Cl.³ B65D *63/08*
U.S. Cl. 24—268 **3 Claims**

1. A clamp which comprises two arcuate portions each hinged to the other along one edge, the other edges of the clamp portions being formed with fingers which interlace when the clamp is closed, each finger having its tip portion bent back on itself to form a flat loop, the looped ends of the individual fingers being so dimensioned that when the fingers are interlaced the looped ends define between them a passage



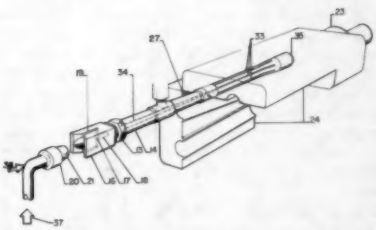
which tapers from one end of the clamp to the other, at least one finger being formed on the outer face of the looped portion with which a tab which is deformable to project into the passage and a tapered pin formed with at least one set of holes longitudinally disposed along the pin in a position such that when the pin is inserted into the passage the holes pass successively across the position of the tab formed on the finger.

4,412,371

DEVICE FOR INTRODUCING A TRAVELING YARN INTO A YARN TREATMENT CHAMBER

Gerry A. Hagen, and Edward N. Donnelly, both of Anderson, S.C., assignors to Badische Corporation, Williamsburg, Va.

Filed Jun. 11, 1981, Ser. No. 273,152
Int. Cl.³ D02G *1/16*
U.S. Cl. 28—272 **3 Claims**



1. A device for introducing a traveling yarn into a yarn treatment chamber and causing the yarn to pass through, out of, and away from the chamber; the device comprising:

(a) a head piece having an orifice communicating with a channel running therethrough and a means for capturing and positioning the traveling yarn in front of the yarn treatment chamber, the head piece providing alignment for the push jet recited in (b) below with respect to the traveling yarn and the yarn treatment chamber;

(b) a push jet having a mating surface for engaging the head piece, the push jet being provided with means for directing gas into the head piece;

(c) means for positioning the traveling yarn across the orifice of the head piece;

(d) means for aligning the push jet so that it is contiguous with the orifice of the head piece;

(e) a yarn cutting means located downstream from the head piece with respect to the direction of yarn travel;

(f) means for common activation of the push jet and the yarn cutting means; and

(g) means for conveying the yarn away from the yarn treatment chamber after it has passed therethrough.

4,412,372

METHOD OF MANUFACTURING BEARING RINGS RUPTURED ALONG AN ARROW-SHAPED PARTITION LINE

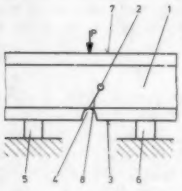
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, and Heinrich Kunkel, both of Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 21, 1980, Ser. No. 209,054

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1979, 2947091

Int. Cl.[3] B21D *53/10;* B23P *17/00*

U.S. Cl. 29—149.5 R 10 Claims



1. In a method for manufacturing a bearing ring fractured along an arrow-shaped partition line, the method including the steps of forming a first radial bore in the wall of the ring intermediate opposite ends of said ring, and forming notches in opposite ends, the notches being displaced in relation to the radial bore in a circumferential direction, the ring having a first of its ends supported on support means, being initially fractured on said first end from the notch down to the radial bore by means of a force directed against the support means, after which the ring is turned over and is fractured again by a force directed against the support means, the improvement comprising the steps:

(a) forming said radial bore in the wall of the ring intermediate said opposite ends, and forming a first notch in only the first end of the bearing ring,

(b) positioning said bearing ring with the first notch on said first end downward upon two support means arranged at a distance from one another, whereby the radial bore and the first notch are situated between the support means,

(c) applying an axially directed force upon the bearing ring upon said second end opposite to the support means, in the plane of the first notch in the first end, until the ring fractures along a fracture line starting from the first notch and extending to the radial bore,

(d) forming a second notch in said second end of the bearing ring opposite the first notch in said first end,

(e) positioning the bearing ring with the second notch on the second end of the bearing ring downwards on said support means, similarly as said first end was positioned, and

(f) applying an axially directed force upon the bearing ring on said first end toward said second end, in the plane of the radial bore, until the ring fractures along a second fracture line starting at the second notch and extending to said radial bore.

4,412,373

METHOD OF MANUFACTURING A THIN COPPER PLATE WITH FLOW CONDUITS

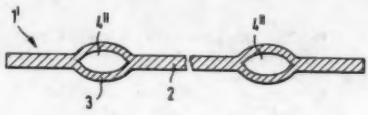
Ahti Kosonen, and Mauri Palmu, both of Pori, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Dec. 24, 1980, Ser. No. 219,979

Claims priority, application Finland, Dec. 28, 1979, 794087

Int. Cl.[3] B21D *53/04;* B21P *15/26*

U.S. Cl. 29—157.3 V 5 Claims



1. A method of manufacturing a generally planar thin plate or band of copper or copper alloy having at least one flow conduit parallel to the plane of the plate or band consisting of the following steps:

(a) continuously casting a thick, profiled billet having an open flow conduit extending therethrough parallel to the plane thereof, said conduit having walls which, measured in a direction perpendicular to the plane of the billet have a total wall thickness at least equal to the thickness of the billet on both sides of the flow conduit;

(b) then cold working the profiled, continuously cast billet to reduce the thickness thereof whereby said conduit is flattened and the conduit walls are pressed into mechanical contact with each other without welding the conduit walls together, and

(c) then opening the flow conduit by applying pressure to the inside of the conduit.

4,412,374

DEVICE FOR CLAMPING AN INSULATED CABLE WIRE TO A TERMINAL ELEMENT

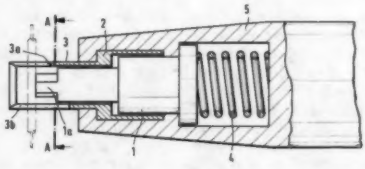
Horst Forberg; Klaus-Peter Achtnig, and Anneliese Stoewe, all of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed May 21, 1981, Ser. No. 265,979

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040709

Int. Cl.[3] H01R *43/00*

U.S. Cl. 29—566.4 6 Claims



1. A device for electrically connecting an insulated thin cable wire to an upright terminal element, said terminal element being formed with spaced parallel legs interconnected by means of a slotted contact portion at an oblique angle with respect to said legs, said legs having support slots aligned with said contact portion slot, said device comprising:

a hollow housing;

a sleeve disposed in said housing and projecting from one end thereof, said sleeve having oppositely aligned slots opening into the distal end of said sleeve;

a plunger mounted within said housing for limited longitudinal movement therein, said plunger having a pressure member extending outwardly from said housing and within said distal end of said sleeve, said distal end of said

sleeve projecting beyond said pressure member, said pressure member being adapted to engage the wire;

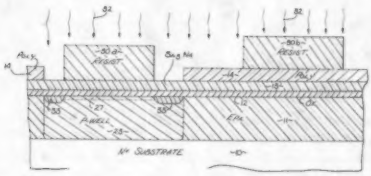
said sleeve being adapted to circumscribe and support said legs of said terminal when said pressure member engages the wire at the top of said terminal and upon insertion of the wire into said contact slot, said sleeve slots encompassing and confining the wire on both sides of said terminal element at all times when said pressure member contacts the wire.

4,412,375

METHOD FOR FABRICATING CMOS DEVICES WITH GUARDBAND

James A. Matthews, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 10, 1982, Ser. No. 387,050
Int. Cl.³ H01L *21/265*
U.S. Cl. 29—571 **13 Claims**



1. The fabrication of a complementary metal-oxide-semiconductor (CMOS) integrated circuit on a silicon substrate, an improvement comprising the steps of:

forming a layer of polysilicon over said substrate,

forming an opening in said layer of polysilicon,

introducing a first dopant into said substrate through said opening so as to form a doped first region in said substrate,

defining a masking member within said opening, said masking member being spaced apart from the edge of said opening formed in said polysilicon layer; and

introducing a second dopant into said first region between said masking member and said edge of said polysilicon opening so as to form a guardband about said first region, whereby a self-aligned guardband is formed in said first region.

4,412,376

FABRICATION METHOD FOR VERTICAL PNP STRUCTURE WITH SCHOTTKY BARRIER DIODE EMITTER UTILIZING ION IMPLANTATION

David E. De Bar, Manassas, Va.; Raymond W. Hamaker, Gilroy, Calif., and Geoffrey B. Stephens, Cary, N.C., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 142,323, Apr. 21, 1980, abandoned, which is a division of Ser. No. 25,693, Mar. 20, 1979, abandoned. This application Mar. 5, 1982, Ser. No. 355,059
Int. Cl.³ H01L *21/265, 21/283*
U.S. Cl. 29—576 B **3 Claims**

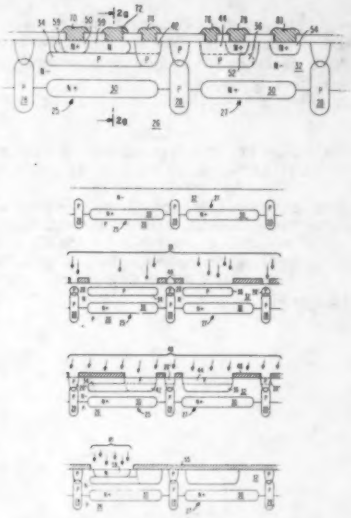
1. A method for fabricating an array of complementary bipolar transistors in an N-type silicon substrate, comprising the steps of:

ion implanting a first plurality of P-type regions relatively deeply beneath the surface of said substrate, a first subplurality thereof forming the subcollectors of PNP transistors and a second subplurality thereof forming the intrinsic base region of NPN transistors;

ion implanting a second plurality of P-type regions shallowly beneath the surface of said substrate, each of a first subplurality thereof juxtaposed above and intersecting respective ones of said first subplurality in said first plurality of P-type regions, forming the collector contacts for said PNP transistors and each of a second subplurality thereof juxtaposed above and intersecting respective ones of said second subplurality of said first plurality of P-type regions, forming the extrinsic base region of said NPN transistors;

ion implanting a plurality of N-type conductivity base regions in said substrate, each juxtaposed above and intersecting a respective one of said first subplurality of PNP subcollectors, forming the base regions of PNP transistors, said N-type base regions having a dopant concentration at the surface of said substrate of less than 10^{17} atoms per cubic centimeter;

depositing a plurality of metal contacts having a metal work function of approximately 4.8 electron volts or greater, on



the surface of said substrate, each spaced from a respective one of said first subplurality of PNP collector contacts and electrically contacting a respective, corresponding one of said plurality of N-type conductivity base regions, forming a Schottky Barrier emitter for each of said PNP transistors, having a barrier height with a magnitude greater than 0.8 electron volts;

ion implanting an N-type dopant as the base contact in said PNP transistors and as the emitter in said NPN transistors;

whereby a plurality of PNP bipolar transistors with Schottky Barrier contact emitters is formed simultaneously with a plurality of NPN transistors on the same semiconductor chip.

4,412,377

METHOD FOR MANUFACTURING A HYBRID INTEGRATED CIRCUIT DEVICE

Kenji Nagashima, Tokyo; Hiroshi Matsumoto, Yokohama; Masataka Tanaka, Kitakyushu; Hirosi Oodaira, Chigasaki, and Nobuo Iwase, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1982, Ser. No. 341,589
Claims priority, application Japan, Jan. 23, 1981, 56-8758
Int. Cl.³ H05K *3/34;* H01L *21/84*
U.S. Cl. 29—577 C **6 Claims**

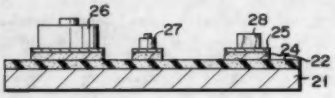
1. A method for manufacturing a hybrid integrated circuit device comprising the following steps in the stated order:

a step of forming a ceramic layer on a metal substrate by flame-spraying a ceramic material onto the metal substrate;

a step of forming on said ceramic layer a resist layer having

a pattern opposite to that of a conductive layer which will be formed on said ceramic layer by a later step;

a step of forming the conductive layer by flame-spraying a conductive material on said ceramic layer using said resist layer as a mask;



a step of impregnating thermosetting insulative material into both said ceramic layer and said conductive layer; and

a step of providing at least one semiconductor element on said conductive layer.

4,412,378

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE UTILIZING SELECTIVE MASKING, ETCHING AND OXIDATION

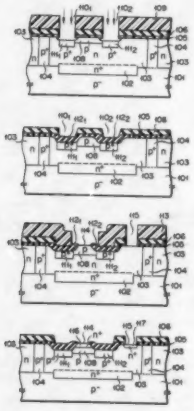
Kazuyoshi Shinada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 22, 1982, Ser. No. 351,251

Claims priority, application Japan, Feb. 24, 2981, 56-25666

Int. Cl.³ H01L *21/302, 21/265*

U.S. Cl. 29—578 **7 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of: forming an oxidation resistive insulating film on a semiconductor body of a first conductivity type; selectively forming a first impurity region of a second conductivity type in said semiconductor body before or after said insulating film is formed; etching part of said insulating film which corresponds to part of said first impurity region and isotropically etching exposed portions of said semiconductor body to a predetermined depth, using said insulating film as a mask; doping an impurity of the second conductivity type into said first impurity region, using said insulating film as a mask, so that a second impurity region of the second conductivity type whose concentration is higher than a concentration of said first impurity region is formed in said first impurity region and said semiconductor body; performing thermal oxidation using said insulating film as a mask, so that an oxide film is formed to cover exposed portions of said first impurity region, said second impurity region and said semiconductor body; and forming a third impurity region of the first conductivity type in said first impurity region which is exposed, after part of said insulating film on said first impurity region is etched.

4,412,379

METHOD OF MANUFACTURING A MULTITRACK MAGNETIC HEAD EMPLOYING DOUBLE HELIX STRUCTURE

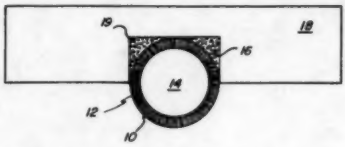
James U. Lemke, Del Mar, and William W. French, Cardiff-by-the-Sea, both of Calif., assignors to Eastman Technology Inc., Rochester, N.Y.

Division of Ser. No. 83,036, Oct. 9, 1979, Pat. No. 4,316,227.

This application Sep. 17, 1981, Ser. No. 303,315

Int. Cl.³ G11B *5/42*

U.S. Cl. 29—603 **3 Claims**



1. The method of making a multitrack magnetic head comprising the steps of:

(a) severing a length of magnetic material which has been wound on a mandrel into a succession of gapped cores by lapping or cutting a longitudinal flat into said mandrel; and

(b) bonding a pole tip piece comprised of discrete pole tip pairs to said mandrel-supported cores in such a way that discrete pole tip pairs magnetically couple to respective cores on said mandrel.

4,412,380

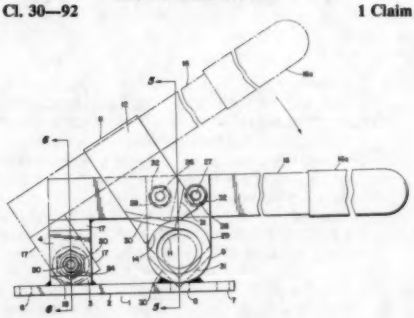
HOSE CUTOFF DEVICE OR TOOL

Arthur S. Kish, Lyndhurst, Ohio, assignor to Murray Corporation, Cockeysville, Md.

Filed Sep. 2, 1981, Ser. No. 298,647

Int. Cl.³ B23D *21/06*

U.S. Cl. 30—92 **1 Claim**



1. A hose cutter or device of the character described comprising a base, a pair of axially-spaced and axially-aligned cylindrical tubes mounted on said base and extending transversely thereof, said cylindrical tubes adapted to receive the hose to be cut, a bracket welded to said base and having an upright flange, an elongated handle pivotally secured to said flange, a cutter blade removably secured to said handle, said cutter blade being of generally rectangular configuration and having cutting edges extending at an angle to each other, said handle adapted to be moved toward said base and into the space between said cylindrical tubes, and a guard of inverted U-shaped configuration comprising a flat base portion and

parallel legs or sides extending downwardly from the marginal edges of said base portion and welded to said cylindrical tubes, said base portion adapted to prevent said handle from being moved beyond a predetermined point relatively to said base.

4,412,381

BLADE HOUSING FOR CAST CUTTING TOOL

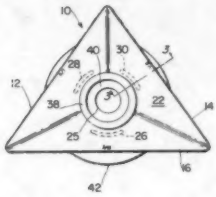
Norbert A. Kirk, 43 E. Ohio St., Room 930, Chicago, Ill. 60611

Continuation-in-part of Ser. No. 180,363, Aug. 22, 1980, Pat. No. 4,316,323. This application May 5, 1981, Ser. No. 260,832

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ B27B *9/02*

U.S. Cl. 30—124 **14 Claims**



1. A plaster cast saw device for cutting a cast comprising:

a cast cutting tool having a body, a shaft extending from said body, and a movable circular saw blade mounted on said shaft;

a housing engaging said body and enclosing portions of the edge of said saw blade, said housing having peripheral straight sides such that said housing has a substantially polygonal profile when viewed normal to a plane which is parallel to said saw blade, and said housing containing a slot through the face of a plurality of said peripheral straight sides through which a portion of said saw blade projects varying distances, whereby the depth of the cut of said saw blade is determined by the side face which is positioned in contact with the cast.

4,412,382

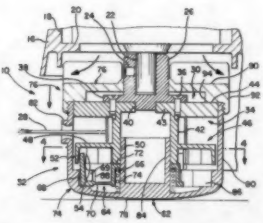
LINE FEED MECHANISM FOR FILAMENT CUTTING

Donald M. White, III, Chanhassen, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed May 4, 1981, Ser. No. 260,450

Int. Cl.³ B26D *1/12*

U.S. Cl. 30—276 **5 Claims**



1. In a vegetation cutting device in which a free end of a flexible filament is rotatably swung as a cutting length about the axis of a drive shaft, apparatus for metering discrete lengths of filament comprising:

(a) driving means for rotatably driving said filament about an axis, said driving means including at lease one driving member;

(b) driven means having at least one driven member selectively engageable with said driving member for selectively coupling said driven means with said driving means for rotation therewith said driven member being capable of radial and rotational movement with respect to said driving member;

(c) spool means for storing said flexible filament, said spool means being coupled to said driving means for rotation therewith; and

(d) means for metering discrete lengths of filament from said spool means to extend said cutting length by bumping said driven means on the ground, wherein the metering means includes means for moving said driven member radially with respect to the drive shaft axis during the bumping opration until said driven member disengages said driving member to free the driven means for rotation relative to the driving means, whereby said spool means pays out a length of filament during said relative rotation, and wherein said driven member is carried on an arm which is radially bendable in response to bumping said driven means on the ground.

4,412,383

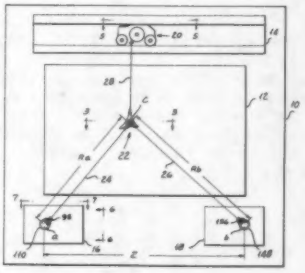
CABLE DRIVEN PLOTTER

Benzion Landa, 10045-118 St., Apt. 206, Edmonton, Alberta, Canada T5K 1Y1

Filed Aug. 13, 1981, Ser. No. 292,723

Int. Cl.³ G01B *5/03, 7/03*

U.S. Cl. 33—1 M **5 Claims**



3. A plotting device comprising a plotting surface, marking means adapted to move freely over said plotting surface, first and second cable means connected at respective ends to said marking means, means including a motor and cable supply means for varying the length of said first cable means, means including a motor and cable supply means for varying the length of said second cable means, third cable means connected at one end to said marking means, and means for maintaining the third cable means in tension.

4,412,384

HEIGHT MEASURING DEVICE HAVING LEVEL INSTRUMENT AND PLATFORM

William Viets, 849 Barth La., Kettering, Ohio 45429

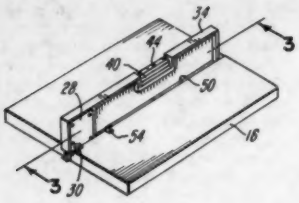
Filed Jun. 15, 1981, Ser. No. 273,467

Int. Cl.³ G01B *3/10, 5/00*

U.S. Cl. 33—169 R **4 Claims**

1. In a device for measuring the height of a person and including a platform, an elongate support member having a lower portion, the platform and the support member being relatively movable, a coiled measuring tape having units of measurements thereupon, the coiled measuring tape being carried by the support member, the measuring tape having an end portion attached to the platform, successive portions of the tape being uncoiled and extendible from the lower portion of the support member as the support member is elevated from the platform when a person whose height is to be measured stands on the platform, a level indicator member carried by the support member, the support member being positionable upon

the head of the person whose height is to be measured as the support member is oriented to a level position by use of the level indicator member, and the height of the person being noted by observing the indicia upon the measuring tape adjacent the support member, the improvement wherein the platform has a slot for receiving the lower portion of the support member, resilient clip means mounted within the slot and



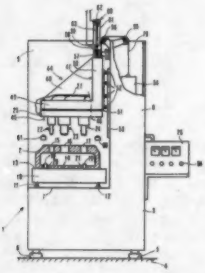
engageable with the lower portion of the support member for releasably attaching the support member to the platform, the clip means being completely recessed within the slot of the platform to provide for unobstructed standing on the platform by the persone whose height is being measured, and to provide a compact unit for carrying and/or storage of the device when the device is not in use for measuring.

4,412,385

GAUGE FOR CHECKING FEATURES - LIKE LINEAR DIMENSIONS - OF A MECHANICAL PIECE

Narciso Selleri, Monteveglio, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Jan. 20, 1982, Ser. No. 341,013
Claims priority, application Italy, Jan. 27, 1981, 3318 A/81
Int. Cl.³ G01B *5/12, 7/12*
U.S. Cl. 33—178 E **10 Claims**



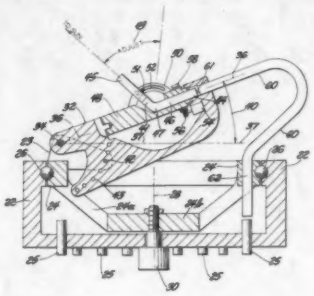
1. A gauge for checking features of a mechanical piece, comprising: a first support for the piece; a second support, the first and the second support being movable one with respect to the other; actuation means to control the relative movement of the supports; gauging means with feeler elements adapted to cooperate with the piece and protection means for protecting the feeler elements, the gauging means being coupled to the second support in order to be selectively arranged in a gauging position—where the feeler elements cooperate with the piece—for providing a signal responsive to said features and in a rest position; and safety means for preventing the gauging means from getting damaged as a consequence of incorrect piece positioning on the first support, or whenever the piece to be checked has an irregular shape, said safety means including a first circuit with first circuit means associated with the first support and including the piece, a second circuit means associated with the second support and control means connected to the actuation means, the first and the second circuit means being adapted to close the first circuit and to switch the control means for stopping said relative movement.

4,412,386

COMPASS

John G. Bennet, Macomb, Mich., assignor to The United States of America as represented by the Army, Washington, D.C.

Filed Aug. 4, 1981, Ser. No. 289,939
Int. Cl.³ G01C *17/34*
U.S. Cl. 33—268 **6 Claims**



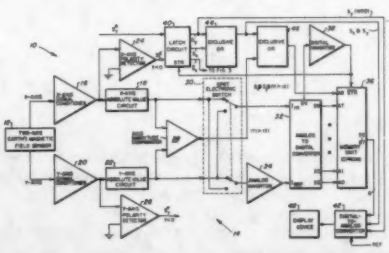
1. A compass comprising a base; a platform mounted for rotation on the base; motor means for rotating the platform in a horizontal plane at a relatively high speed; a frame located in close proximity to the platform; a swingable connection between the platform and frame enabling the frame to have angular motion in the elevational direction; means holding the frame in selected positions of adjustment in the elevational direction, whereby the frame can establish a sight line with the north star at a particular point in the platform rotational cycle; a columnar element oriented on the frame so that its axis coincides with the north star sight line; means for slowly rotating the columnar element around its axis once per twenty four hour day; a telescope mounted on the columnar element; and means for adjusting the telescope so that its optical axis has a predetermined angle to the columnar element axis, the predetermined angle being such that when the columnar element is sighting the north star the telescope will be sighting the sun.

4,412,387

DIGITAL COMPASS HAVING A RATIOMETRIC BEARING PROCESSOR

Daniel S. Lenko, Monrovia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 10, 1982, Ser. No. 376,474
Int. Cl.³ G01C *17/28*
U.S. Cl. 33—361 **16 Claims**



1. An improved digital compass of the type in which a

two-axis earth's magnetic field sensor generates two bipolar analog signals, an x-axis signal and a y-axis signal indicative of bearing, which define sine and cosine functions when said two-axis earth's magnetic field sensor is rotated in the earth's magnetic field, and in which a bearing processor is operatively connected to said two-axis earth's magnetic field sensor for computing a digital bearing in binary form, wherein the improvement comprises:

means operatively connected to said two-axis earth's magnetic field sensor for generating the absolute values of the x-axis signal and the y-axis signal;

means operatively connected to said two-axis earth's magnetic field sensor for detecting the polarities of the x-axis signal and the y-axis signal as indicated by S_x* and S_y* signals, respectively, and wherein the S_x* and S_y* signals are logical "0" for a respective positive axis and a logical "1" for a respective negative axis information;

means connected to said means for determining the absolute values of the x-axis signal and the y-axis signal for comparing the magnitudes thereof to determine which axis has the larger absolute magnitude, wherein a logical "0" output from said means for comparing the magnitudes is indicative of the fact that $|y| < |x|$, and a logical "1" indicative of the fact that $|y| > |x|$;

a double-pole-double-throw (DPDT) electronic switch having first and second poles operatively connected to the output of said magnitude comparing means, a first set of terminals being operatively connected to the x-axis absolute value output and a second set of terminals being operatively connected to the y-axis absolute value output of said absolute value generating means, the output of said magnitude comparing means controlling the position of said DPDT electronic switch such that the smaller of the absolute value of x or y is always fed to said first pole and the larger of the absolute values of $|x|$ or $|y|$ is always fed to said second pole;

an analog-to-digital converter connected at an I_{IN} input to said first pole of said DPDT electronic switch and operatively connected at an I_{REF} input to said second pole of said DPDT electronic switch, said analog-to-digital converter being configured for ratiometric measurements, wherein the digital output is the ratio I_{IN}/I_{REF} of the analog inputs, and wherein said analog-to-digital converter computes the ratio y/x for the angles 335° thru 45° and 135° thru 225° and the ratio x/y for the remaining angles 45° thru 135° and 225° thru 335°;

means connected to said means for detecting the polarities of the x-axis signal and the y-axis signal (S_x* and S_y* respectively) and operatively connected to a data valid (DV) output of said analog-to-digital converter at its STR input for latching the polarity of the axis information at the end of each analog-to-digital conversion upon the application of a DV signal to eliminate the effects of changing polarities of the axes of said two-axis earth's magnetic field sensor during rotation thereof while a bearing indication is being presented, wherein S_x is representative of S_x* after storage and S_y is representative of S_y* after storage;

a first exclusive-OR circuit connected to said means for storing means polarity data for generating the logic signal $S_x \oplus S_y$ at its output;

a second exclusive-OR circuit connected to the output of said first exclusive-OR circuit and connected to the output of said means for comparing the magnitudes of the x-axis signal and the y-axis signal for generating the logic control signal $S_x \oplus S_y \oplus (|y| > |x|)$; and

a memory unit operatively connected to the output of said analog-to-digital converter and to the output of said second exclusive-OR circuit and being programmed in such a fashion as to compute the arc tangent of the ratio y/x or the ratio x/y according to the output of said analog-to-digital converter and the logic control signal $S_x \oplus S_y \oplus (|y| > |x|)$, and said memory unit also being programmed in such a fashion as to output a quadrant dispiacement angle in binary form from 0° thru 90° referenced to the cardinal point forming the lower boundary of the quadrant of interest, the quadrant displacement angle in binary form, along with the logic signals S_y and $S_x \oplus S_y$ being representative of the digital bearing.

4,412,388

METHOD FOR DRYING SEMICONDUCTOR SUBSTRATES

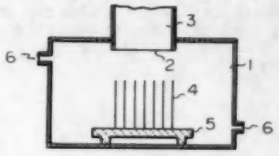
Mikio Takagi, Kawasaki, and Hajime Kamioka, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 22, 1980, Ser. No. 218,802

Claims priority, application Japan, Dec. 25, 1979, 54-169041

Int. Cl.³ F26B *3/34*

U.S. Cl. 34—1 **11 Claims**



1. A method for drying semiconductor substrates, which comprises irradiating a plurality of semiconductor substrates with electromagnetic waves emitted from a waveguide in a non-reactive atmosphere of normal atmospheric pressure while holding the semiconductor substrates so that the predominant faces thereof substantially form right angles to the face of an opening of the waveguide, wherein the semiconductor substrates are positioned in a row on a substrate holder and a pair of dummy substrates are placed on the ends of said row, and wherein the substrates are placed at intervals of from about 5 mm to about 20 mm.

4,412,389

METHOD OF AUTOMATICALLY CONTROLLING THE DRYING PROCESS IN A LAUNDRY-DRYING SYSTEM, AND EQUIPMENT FOR PERFORMING THE METHOD

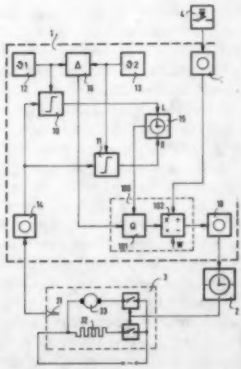
Manfred Krüger, Berlin, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 6, 1981, Ser. No. 290,513

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030864

Int. Cl.³ F26B *21/10*

U.S. Cl. 34—46 **29 Claims**



1. Method of automatically controlling the drying process of a laundry drying system until a given desired degree of dryness

is reached, including heating means, a drive for the drying system, a control device for controlling the drive and heating means, and means for supplying system-related fixed data concerning the drying of particular laundry, which comprises determining the gradient of rising air temperature leaving the drying system during a given early phase of the drying process, calculating a required operating time for the heating means and the drive from the determined gradient and the system-related fixed data, and feeding the calculated operating time as an input to the control device.

4,412,390

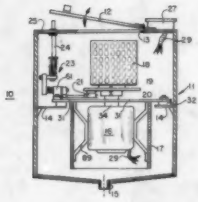
CENTRIFUGAL SPIN AIR DRYER

William P. Grant, 620 Cleveland Ave., Elgin, Ill. 60120

Continuation-in-part of Ser. No. 190,020, Sep. 23, 1980, abandoned. This application Nov. 10, 1981, Ser. No. 319,930

Int. Cl.³ F26B *11/08*

U.S. Cl. 34—58 **3 Claims**



1. A centrifugal extractor apparatus comprising in combination cabinet means defining an interior cavity and including a top wall defining a first opening therein, hinged cover means to be pivotally connected to the top wall and moveable between closed and open positions with respect to the first opening, rotatable shaft means to be mounted in the interior cavity, motor means to be connected to the rotatable shaft for rotating same, basket means for receiving wet articles to be spun dry and being connectible to the rotatable shaft means, braking means to be mounted in the interior cavity and being selectively engageable to arrest the rotational movement of the shaft, brake linkage mechanism connectible to the braking means and being engageable by a substantially closed cover means, motor activation means to be activated during movement of the cover means to the closed position thereof, the improvement comprising rotatable disc-type brake plate means for the braking means to be mounted to the shaft means for rotation therewith, pivotal disc-type brake pad means for the braking means biased to normally engage the brake plate means for preventing rotation, and being selectively moveable to release engagement therewith, pivotal lever arm means for the brake linkage mechanism carrying thereon the pivotal brake padmeans and biased toward engagement with the brake plate means, and post means for the brake linkage mechanism to be connected to the lever arm means and extendible from the cabinet means in alignment for contact by the cover means during closing thereof, the post means being moveable by the closing cover means to move the lever arm means against the bias thereof for selectively releasing engagement between the brake plate means and the brake pad means, and said cabinet means including a bottom wall defining a first opening and a second opening therein, said bottom wall tapering outwardly to converge on the first opening for draining moisture therefrom, enveloping shroud means being mounted within said interior cavity of the cabinet means to envelope the motor means and extending to communicate with the second opening of the bottom wall whereby outside ambient air is excessible to the motor means and the shroud means prevents moisture contact with the motor means.

4,412,391

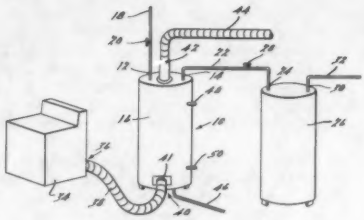
WATER HEATER UTILIZING LAUNDRY DRYER EXHAUST

John V. Bolognino, 24836 Masch, Warren, Mich. 48091

Filed Sep. 29, 1982, Ser. No. 427,458

Int. Cl.³ F26B *19/00*

U.S. Cl. 34—90 **13 Claims**



1. A water preheating system for use with a laundry dryer having a vent for exhausting heated air therefrom and a hot water heater having an inlet pipe for coupling to a source of water to be heated comprising:

a tank having an underside;

a base for supporting said tank;

air intake port receptive of heated air from said dryer vent;

air retainer means for directing said heated air from said air intake port generally towards the underside of said tank, wherein said air retainer means and the underside of said tank define a heating chamber;

exhaust flue communicating with said heating chamber;

condensation collection means disposed on said base generally beneath the underside of said tank having drain orifice therein for collecting and removing condensation from said heating chamber;

water inlet means adapted to receive water from a supply main and communicating with said tank for filling said tank;

water outlet means adapted to be coupled to the inlet pipe of said hot water heater so as to supply preheated water to said hot water heater.

4,412,392

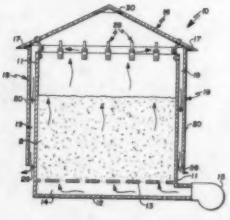
GRAIN DRYING AND STORAGE STRUCTURE

Richard L. Keller, Tenney, Minn. 56582

Filed Jun. 7, 1982, Ser. No. 385,667

Int. Cl.³ F26B *11/00*

U.S. Cl. 34—233 **9 Claims**



1. In a drying structure of the type having an exterior wall with an upper edge, an inclined roof structure with a lower portion extending outwardly beyond and overhanging the upper edge of the exterior wall, a perforated false floor on which a material to be dried is placed and means for driving heated air from under the perforated false floor up into and through the material to be dried, the improvement comprising:

(a) means for supporting the roof structure so that its lower portion is spaced equidistant above the upper edge of the wall;

(b) a shell structure for surrounding a portion of the wall, said shell structure having an upper edge and a lower edge and extending substantially continuously around the exterior of the wall; and

(c) means for holding the shell structure exterior of the wall so that the shell is in a spaced relationship with the wall, the upper edge of the shell being in close proximity to the overhanging lower portion of the roof structure where it extends outwardly beyond the upper edge of the wall, and the lower edge of the shell extending at least fifty percent of the distance between the overhanging lower portion of the roof structure and the perforated floor of the drying structure, whereby the heated air, after passing upwardly through the material to be dried, is directed through the space defined between the upper edge of the wall and the lower portion of the roof structure and thereafter passes downwardly through the space defined between the shell structure and wall so as to protect the wall adjacent the shell from ambient temperature and to also prevent condensation from forming on the interior of the wall.

4,412,393

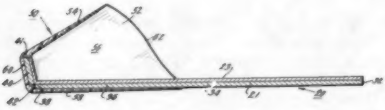
BALLET TOE SHOE AND PROCESS OF MANUFACTURE THEREOF

Nicholas Terlizzi, Jr., North Haledon, and Donald Terlizzi, Paquannock, both of N.J., assignors to Ballet Makers, Inc., Totowa, N.J.

Filed Jul. 10, 1981, Ser. No. 281,947

Int. Cl.[3] **A43B** *3/00, 23/00;* **A43C** *13/14;* **A43D** *9/00*

U.S. Cl. 36—113 **26 Claims**



1. A shank and toe box support frame combination for a ballet toe shoe, or the like, comprising:

a shank for being located in a ballet toe shoe beneath the sole of a wearer of the toe shoe; the shank having a front end; a tip flap located at the front end of the shank; the tip flap being folded up from the portion of the shank beneath the wearer's sole to define a front tip panel of the toe box support frame;

the toe box support frame being shaped to define a toe box for a ballet toe shoe for covering over the front portion and toes of a wearer's foot; the toe box support frame having a front end and the tip flap at the front end of the shank being integrated with the support frame for at least in part defining the front end of the support frame; the support frame having an open rear end and having and defining an interior into which the toe and foot of the wearer are placed; the support frame having an exterior; the shank extending rearwardly from the front end of the support frame and extending out the rear end of the support frame.

20. A method of making a combination of a toe box support frame and a shank for a ballet toe shoe, or the like, the method comprising:

applying a ballet toe shoe shank having a front end, with a foldable tip flap being defined on the front end of the shank, to the toe shoe sole side of a male mold member that is generally in the shape of a toe box of a ballet toe shoe, and the shank being applied to the male mold member so that the tip flap of the shank extends forward of the forward end of the male mold member;

inserting the male mold member, forward end first, into the mold cavity of a female mold member which cavity has a profile that generally conforms to the external profile of the male mold member, and the respective profiles of the male and female mold members being shaped so that there is a narrow space defined between the male and the female mold members for receiving a moldable resin material, or the like; the male mold member being inserted far enough for the tip flap at the front of the shank to contact the interior of the female mold member for then folding up the tip flap over the front end of the male mold member, whereby the tip flap is then in position to be at the front tip of the toe box support frame;

applying resin in the space between the male and the female mold members and also applying the resin over the tip flap, and allowing the resin to set for thereby defining the toe box support frame and for integrating the shank and the support frame; and

removing the toe box support frame with the shank integrated therewith from the mold members.

4,412,394

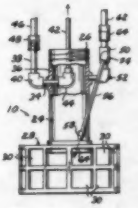
DREDGING SUCTION-JET HEAD

Earnest Z. Coker, 1525 SW. 23, Oklahoma City, Okla. 73108

Filed Sep. 9, 1982, Ser. No. 416,413

Int. Cl.[3] **E02F** *3/88*

U.S. Cl. 37—57 **3 Claims**



1. In a boat supported placer-stream dredging apparatus having a generally vertical gangue tube extending from the placer above the surface of the stream and generating an upward flow of gangue therethrough and having first and second pressure hoses coextensive with the gangue tube and containing water under greater than atmospheric pressure, the improvement comprising:

a dredging head secured to the depending end of said gangue tube, said dredging head comprising,

an open end section of pipe coaxially secured at one end portion to the depending end of said gangue tube,

nipple means communicating with the first said pressure hose and extending through the wall of said pipe section for reducing stream water pressure within the pipe section by generating an upwardly directed jet action water flow therethrough,

cage means consisting of a cylindrical member having a top end wall of greater diameter than said pipe section coaxially secured to the depending end portion thereof and having a closed bottom wall spaced from said top wall a distance at least equal to one-half its diameter, the wall of said cylindrical member having openings therein dimensioned for limiting the diametric size of gangue particles passing through the openings in response to lateral movement of the cylindrical member across a stream bed by the trailing action of the gangue tube following boat movement,

a cross communicating with said second pressure hose and rigidly secured to said pipe section opposite said nipple means, and,

angularly downward directed nozzle means communicating with said cross for impinging a high velocity stream of water on the gangue at opposite sides of said cage.

4,412,395

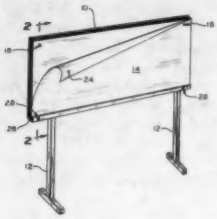
DISPLAY DEVICE

William R. Markin, 5502 Chippewa Rd., Toledo, Ohio 43613

Continuation of Ser. No. 938,017, Aug. 30, 1978, abandoned. This application Dec. 1, 1980, Ser. No. 211,836

Int. Cl.³ G09F *19/00*

U.S. Cl. 40—530 **3 Claims**



1. A free-standing device for supporting a tablet of sheets of paper comprising:

a backing plate including an upper marginal edge and lower marginal edge;

at least one floor engaging leg attached to and supporting said backing plate in a substantially upright position;

means for positioning the upper marginal edge of the tablet of sheets of paper and releasably securing the upper marginal edge of the sheets of paper along the upper marginal edge of said backing plate such that each sheet of paper in the tablet may be individually released;

a channel member, generally U-shaped in cross section, secured to and coextensive with the lower marginal edge of said backing plate adapted to receive and contain the lower marginal edge of a tablet of sheets of paper; and

clamping means affixed to one leg of said channel member for snuggly securing the lower marginal edge of the tablet of sheets of paper within said channel member.

4,412,396

SIGN HOLDER WITH REVERSIBLE SUPPORTING BRACKETS

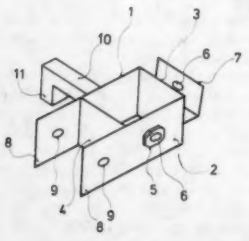
Hermann Silbernagel, Friesenheimer Strasse 7a, 6800 Mannheim 1, Fed. Rep. of Germany

Filed Jan. 17, 1980, Ser. No. 113,110

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 7930368[U]

Int. Cl.³ G09F *15/00*

U.S. Cl. 40—607 **6 Claims**



1. A sign holder comprising:

at least one post of square shaped cross-section, over which several reversible supporting brackets each having a square shaped opening therethrough are placed which embrace said post;

each said square shaped opening supporting bracket having at the front thereof an angle iron for holding an edge of a sign from either above or below;

each said supporting bracket further having on at least one side thereof a threaded hole, more particularly in the form of an external nut provided on the outside of the supporting frame in which a screw can be threaded, said screw being turned into engagement with the post so as to lock each supporting bracket thereto, and

at least one bracket having said angle iron sloped slightly outwardly away from the front of said supporting bracket so that when said at least one bracket is used to hold an edge of a sign from below the weight of the sign effects a wedging action with said bracket.

4,412,397

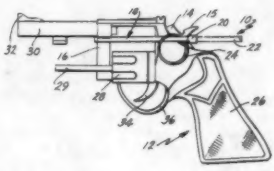
FIREARM SAFETY APPARATUS AND METHOD OF USING SAME

William H. Bayn, 5095 Pettis, Belmont, Mich. 49306

Filed Mar. 19, 1982, Ser. No. 359,683

Int. Cl.³ F41C *27/00*

U.S. Cl. 42—1 LP **54 Claims**



10. A firearm safety device for rendering a firearm positively but temporarily inoperative, the firearm having a first element normally movable to a ready-fire position, the device comprising:

a fracturable strap; and

means for securing said fracturable strap about the firearm to prevent the first element from moving to the ready-fire position, whereby the firearm is rendered operative by fracturing said strap and removing said strap from the firearm.

4,412,398

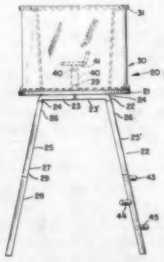
HUNTING STAND

Alvin E. Harmon, R.R. 1, Bagley, Minn. 56621

Filed Mar. 17, 1981, Ser. No. 244,660

Int. Cl.³ A01M *31/02*

U.S. Cl. 43—1 **3 Claims**



1. A hunting platform device comprising an upright sleeve, a platform, said upright sleeve being mounted on said platform and having a vertical axis perpendicular to said platform, said sleeve being made of flexible material, a seat mounted on said platform, said sleeve being movable upward from a position

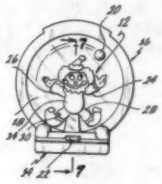
adjacent the platform to a raised position, said sleeve when raised having a height extending from the platform to a height above the seat to surround said seat and form a wall enclosing said seat, to at least partially conceal an operator seated on said seat, said sleeve being open across its top, support means for supporting said sleeve in its raised position, said support means comprising a hoop fixed about the upper open end of said sleeve, removable rods having their upper ends engaging said hoop for supporting said hoop and thereby supporting said sleeve, with their lower ends mounted to said platform, a plurality of legs mounted beneath said platform to support said platform in a raised position above the ground.

4,412,399

JUGGLING TOY

Akira Abe, Tokyo, and Tomihisa Tanimura, Mibu, both of Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,524
Claims priority, application Japan, Dec. 18, 1980, 55-182334
Int. Cl.³ A63H *1/32*
U.S. Cl. 46—47 **7 Claims**



1. A toy which comprises:

a housing;

movable means rotatably mounted on said housing such that it is capable of reciprocal movement in an arcuate pathway with respect to said housing;

moving means located on said housing in association with said movable means and capable of interacting with said movable means at at least two points in said arcuate pathway, each of said interactions of said moving means with said movable means capable of at least inhibiting movement of said movable means in one direction and further capable of initiating movement in the opposite direction;

at least a portion of said movale means comprises an object capable of moving in said arcuate pathway;

said moving means interacting with said object, said interaction of said moving means with said object capable of at least inhibiting the movement of said object in said one direction and further capable of initiating movement of said object in said other direction;

said moving means comprises a first and a second element and an element activation means, said first and said second element each having an end and each movably mounted on said housing such that said end of said first and said second elements is capable of moving and contacting said object, said first and said second elements each operatively associated with said element activation means and each movable in response to said element activation means.

4,412,400

APPARATUS FOR BURNISHING

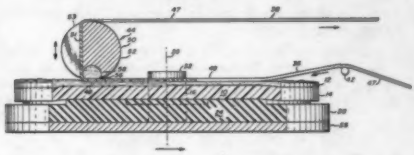
Craig B. Hammond, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Division of Ser. No. 198,714, Oct. 20, 1980, Pat. No. 4,347,687. This application May 5, 1982, Ser. No. 374,934
Int. Cl.³ B24B *21/16*
U.S. Cl. 51—58 **18 Claims**

1. Apparatus for burnishing an annular region of a circular surface of a disk which comprises:

means for rotating a disk having a coated surface about an axis substantially normal to said coated surface whereby a plane of rotation is established for said coated surface;

a burnishing head having an outer surface secured so as to permit moving the burnishing head into close proximity to said plane of rotation and to permit oscillating the burnishing head laterally to said plane of rotation, said burnishing head having a length of tape having a working surface thereon wrapped partially around said outer surface of the burnishing head closest to said plane of rotation when the burnishing head is moved into close proximity to said plane of rotation, said burnishing head further adapted to constrain said length of tape so received so as to cause said received tape to move laterally with the burnishing head when the head is moved into close proximity to said plane of rotation and is oscillated laterally back and forth;



means for securing a length of said tape and having a guide surface means for guiding said tape around said outer surface of the burnishing head and establishing a tape path wherein said tape surface closest to said plane of rotation has a first segment located about the burnishing head and urged into intimate contact at a first force with the surface of a disk located in said plane of rotaion and said tape surface has a second segment having a common terminal end with said first segment, which second segment is urged toward said circular surface at a lesser force than said first force;

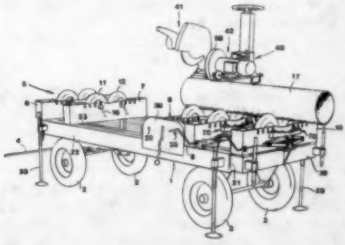
means for oscillating the burnishing head back and forth laterally relative to said plane of rotation when the head is moved into close proximity to said plane of rotation.

4,412,401

APPARATUS FOR PROCESSING TUBES

Bo W. Fundell, Alvkarleby, Sweden, assignor to Skutskars Rostfria AB, Skutskar, Sweden

PCT No. PCT/SE80/00236, § 371 Date May 29, 1981, § 102(e) Date May 29, 1981, PCT Pub. No. WO81/00821, PCT Pub. Date Apr. 2, 1981
PCT Filed Oct. 1, 1980, Ser. No. 269,026
Claims priority, application Sweden, Oct. 1, 1979, 7908103
Int. Cl.³ B24B *5/34, 27/04*
U.S. Cl. 51—103 R **10 Claims**



1. An apparatus for processing tubes and the like, said apparatus comprising a frame, support means for supporting a tube above said frame and a processing tool for working upon the tube, said support means being a plurality of supports spaced

along a longitudinal axis of said frame, each of said supports having two roller elements for permitting rotation of the tube relative to said processing tool, at least one of said supports being movable along said frame, said processing tool being carried by said movable support whereby said processing tool may be moved to various positions along the length of said frame, means for locking said movable support to said frame in a stationary adjusted position, and said locking means including means for raising and lowering said two roller elements of said movable support vertically into and out of contact with a tube supported by others of said supports whereby said movable support and said processing tool may be readily adjusted relative to such a supported tube.

4,412,402

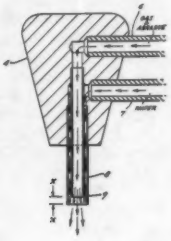
EQUIPMENT AND METHOD FOR DELIVERING AN ABRASIVE-LADEN GAS STREAM

Ben J. Gallant, Portland, Tex., assignor to Cavitron Inc., Long Island City, N.Y.

Continuation of Ser. No. 65,288, Aug. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 14,435, Feb. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 928,907, Jul. 28, 1978, Pat. No. 4,174,571. This application Oct. 17, 1980, Ser. No. 197,886

Int. Cl.³ B24C *5/04*

U.S. Cl. 51—439 **24 Claims**



1. A method for effecting abrasion comprising delivering from a nozzle orifice a pressurized jet of particle-laden gas, with resultant development of an ambient induction zone, releasing a substantially unpressurized flow of the liquid into an annual space surrounding the ambient induction zone and thereby establish a combined stream of gas, particles and liquid, and directing the combined stream against the surface to be abraded.

4,412,403

TELESCOPING GRANDSTAND ARRANGEMENT

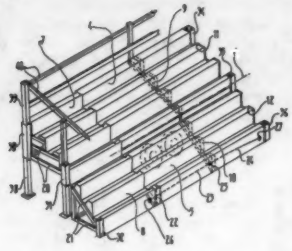
Christiane LeFranc, 72, avenue du Midi, 63800 Cournon, and Francois Verdier, 46, Boulevard Cote Blakin, 63000 Clermont-Ferrand, both of France

Filed May 21, 1982, Ser. No. 380,566

Int. Cl.³ E04H *3/12*

U.S. Cl. 52—9 **10 Claims**

1. In a tiered grandstand arrangement of the type adapted to support individuals for purposes including group photography of the individuals and seating thereof to watch a show, conference, or other event, and of the type formed of a frame mounted on wheels and equipped with means to permit towing to a desired location, comprising a first, top group of tiers being permanently mounted on said frame, and a second, bottom group of tiers hingedly joined to the first group about a horizontal axis parallel to the length the tiers of the first and second groups thereof, the second group being pivotally movable about said axis to be folded onto and placed atop the first group for travelling, and to be unfolded therefrom into an opened position for use; the improvement wherein each of said first and second groups of tiers has a generally tubular prismatic structure, and there are further provided for each of said first and second groups of tiers at least one inside group of tiers of structure similar to the associated one of said first and second groups of tiers, the latter forming outside groups of tiers relative to said inside groups of tiers and serving as housings



for the associated inside groups of tiers, the latter being slideable relative to the outside groups of tiers to permit expansion of the usuable capacity of the first and second groups of tiers by pulling out said inside groups of tiers.

4,412,404

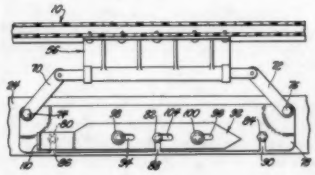
COMBINED VENT AND ESCAPE HATCH

Donald L. Manning, Orchard Lake, Mich., assignor to Transpec, Inc., Troy, Mich.

Filed Apr. 19, 1982, Ser. No. 369,387

Int. Cl.³ E05B *65/10*; E05C *15/02*; E05D *15/50*

U.S. Cl. 52—19 **7 Claims**



1. A combined vent and escape hatch assembly of the type adapted to be mounted in an opening on a vehicle roof, said assembly comprising a lid, a lid supporting ring of generally the same shape and size as the roof opening and mounted on said roof so as to surround said opening, a pair of linkage mechanisms mounted on laterally opposite sides of and connected between said lid and said ring, each linkage mechanism comprising first and second bracket members respectively connected to said lid and said ring and lever means interconnecting said bracket members to permit said lid to be moved between a seated position upon said ring closing the roof opening and a plurality of partially opened venting positions in which the id is supported by both of said linkage mechanisms, and a latching means for disconnecting one of said linkage mechanisms whereby the lid may be moved to a fully opened position relative to the roof opening, the improvement in said latching means comprising:

A. a latch element slidably mounted on one of said second bracket members; and

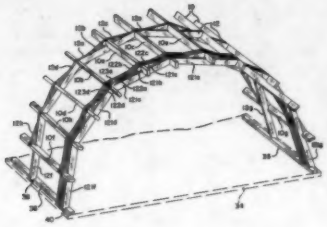
B. said ring including means for supporting one second bracket member, said latch element being adapted to coact with the bracket supporting means to releasably lock said one second bracket member against movement relative to said ring.

4,412,405

INTERLOCKING BUILDING STRUCTURE

Jasper J. Tucker, 4674 Tragen Ct., SE., Salem, Oreg. 97302

Filed Aug. 28, 1981, Ser. No. 297,314
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—86 **8 Claims**



1. An interlocking building structure comprising:

a plurality of rigid elongated stringer members and a plurality of rigid elongated cross members for positioning crossways of said stringer members,

said cross members each being provided with an upper slot intermediate ends thereof for receiving a stringer member,

said stringer members having upper slots for receiving ends of cross members,

ones of said cross members being offset from one another so that their upper slots receive different stringer members,

wherein a given stringer member is received in an upper slot of a given cross member while ends of said given cross member are received in upper slots in second and third next adjacent stringer members on either side of said given stringer member,

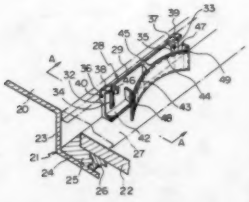
an end of a cross member offset from said given cross member being received in an upper slot in said given stringer member while said second and third stringer members are respectively received in upper slots in offset cross members.

4,412,406

METHOD OF AND A DEVICE FOR FIXING A WINDOW MOLDING ONTO A WINDOWPANE

Ikuo Sengoku, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 3, 1981, Ser. No. 250,678
Claims priority, applicati..a Japan, Nov. 5, 1980, 55-154572
Int. Cl.³ E06B *3/00*
U.S. Cl. 52—208 **26 Claims**



11. A windowpane assembly of a vehicle, which has a window molding and a windowpane arranged in an L-shaped cross-sectional fillister of a vehicle body, said fillister extending along an outer periphery of the windowpane and comprising a riser portion which extends inwardly from the vehicle body, and a bottom portion which extends substantially parallel to the vehicle body from an inner end of said riser portion, the windowpane being stuck onto the bottom portion by means of an adhesive material, a gap formed between the riser portion and the outer periphery of the windowpane being covered by the window molding which has a substantially C-shaped cross-section and an outer periphery, said device having a molding clip fixed onto the riser portion of said fillister and inserted into the gap for fixing the window molding onto the windowpane, said molding clip comprising:

a holding portion engageable with the outer periphery of said window molding to hold said window molding;

an elastic wing member intended to resiliently abut against the outer periphery of the windowpane within the gap;

latch means engageable with said elastic wing member for maintaining said elastic wing member in a compressed state to accumulate the elastic force of said elastic wing member, and;

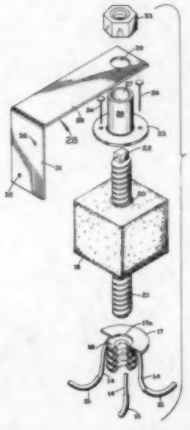
disengaging means for disengaging said elastic wing member from said latch means and causing said elastic wing member to resiliently abut against the outer periphery of said windowpane, said disengaging means comprising the outer periphery of said window molding, which is engageable with said elastic wing member.

4,412,407

MOUNTING ARRANGEMENT FOR GUARD RAIL POST

Samuel T. Melfi, 520 NE. Wavecrest Ct., Boca Raton, Fla. 33432, and Nicholas J. Melfi, 680 SW. 14th St., Deerfield Beach, Fla. 33441, assignors to Samuel T. Melfi; Anna J. Melfi, both of Boca Raton and Nicholas J. Melfi, Deerfield Beach, all of, Fla.

Continuation-in-part of Ser. No. 273,359, Jun. 15, 1981, abandoned. This application Oct. 2, 1981, Ser. No. 307,731
Int. Cl.³ E04B *1/38*
U.S. Cl. 52—699 **1 Claim**



1. For use in anchoring an upstanding guard rail support post to a concrete floor slab, the improvement which comprises:

a helically wound wire nut having its successive helical turns engaging each other and defining a downwardly extending screw-threaded passageway for threadedly receiving a screw-threaded stem on the lower end of the support post;

a rigid elongated bolt having an externally screw-threaded lower end threadedly received in said screw-threaded passageway in the nut, said bolt extending up from said nut above the level to which the concrete floor slab is to be poured and having a screw-threaded upper end;

a bracket having a horizontal top leg with a vertical opening therein which passes said bolt and a vertical leg extending down from said top leg for attachment to a perimeter board of a form for the concrete floor slab;

spacer means engaged between said horizontal top leg of said bracket and the top of said nut, said spacer means having a vertical opening therein which passes said bolt; said spacer means comprising:

a lower, rigid, flat, annular washer engaging the top of said wire nut;

a block of expanded plastic extending up from said lower washer to form a complementary recess in said concrete floor slab above said wire nut, said block having a central vertical opening which registers with the screw-threaded passageway in said wire nut;

an upper, rigid, flat, annular washer on top of said block;

and a rigid sleeve extending up from said upper washer to said horizontal top leg of said bracket;

a clamping nut threadedly engaging the screw-threaded upper end of said bolt above said horizontal top leg of the bracket and clamping the latter down against said spacer means;

and a plurality of feet extending down from said nut to engage a bottom wall of the form and hold the wire nut spaced above said bottom wall.

4,412,408

HEAT-INSULATION BUILDING BLOCK OF ALL-METAL CONSTRUCTION

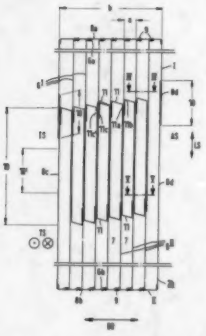
Manfred Scholz, Erlangen, and Wolfgang-Peter Fricker, Freinsheim, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 17, 1981, Ser. No. 244,653

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1980, 3010256

Int. Cl.³ E04C *2/34*

U.S. Cl. 52—806 **7 Claims**



1. Heat-insulation building block formed of at least two parts slideable relative to one another over a given range and, respectively, including between two metal housing sheets maintained at a constant spacing from one another, a multiplicity of metallic insulation foils disposed consecutively in direction of said spacing between said housing sheets, and spacer elements holding the insulation foils in spaced relationship to one aother, adjacent pairs of the consecutive insulation foils forming respective insulation cells, the housing sheets and the insulation foils of the respective parts being nested overlappingly within one another in consecutive alternating fashion within the given sliding range, the housing sheets and the insulation foils of the slideable parts nested within one another having respective overlap lengths greater than a maximum enlargement of the building block resulting from sliding the parts of the building block apart in direction of the given sliding range, comprising bent-away portions formed at a free end of the insulation foils of at least one of the relatively slideable building-block parts, said bent-away portions bridging the space between respective pairs of the consecutive insulation foils and tightly engaging elastically respective adjacent insulation foils of at least the other of the relatively slideable building-block parts, and hair-pin shaped bent-away portions formed as pockets engaging in one another at free ends of the housing sheets of the two building-block parts forming the building block.

4,412,409

METHOD OF CLOSING THE MOUTH OF A CONTAINER AND A SCREW CAP FOR USE THEREIN

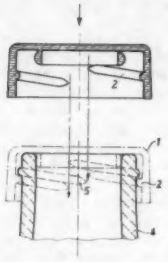
Dietmar Aichinger, Reinach; Hans-Werner Breuer, Balsthal, and Albert Obrist, Kaiseraugst, all of Switzerland, assignors to Albert Obrist AG, Reinach, Switzerland

Filed Feb. 13, 1981, Ser. No. 234,558

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006481

Int. Cl.³ B67B *3/22, 3/20, 1/08;* **B65B** *7/28*

U.S. Cl. 53—485 **8 Claims**



1. A method of closing a container mouth having an external screw-thread by a screw cap of resilient plastics material having an internal screw-thread of corresponding pitch, comprising locating the screw cap on the container mouth in a predetermined angular orientation corresponding to the angular orientation of the cap in its final position when the container is closed by screwing on the cap with a certain screw torque to fully engage the threads, and then applying pressure in the axial direction of the container to snap the cap over the threads of the container into its final position as would be occupied if screwed on with said certain torque.

4,412,410

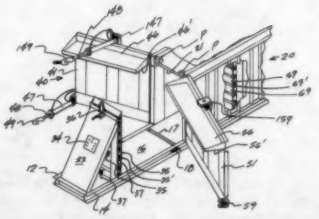
HORIZONTAL BALING APPARATUS AND METHOD

George F. Smith, Jr., Spartanburg, S.C., assignor to Hergeth, Incorporated, Spartanburg, S.C.

Continuation of Ser. No. 186,193, Sep. 11, 1980. This application Apr. 29, 1981, Ser. No. 258,766

Int. Cl.³ B65B *63/02*

U.S. Cl. 53—528 **25 Claims**



1. A horizontal baling apparatus comprising:

(a) a frame, said frame having a bottom wall and a vertical, stationary platen secured at one end of same, said frame also including a housing located at an end of same oppo-

site said stationary platen, said housing defining a horizontal passageway therealong and being spacially separate from said stationary platen, said frame further having a pair of side wall sections pivotally secured thereon for movement between a closed position adjacent said housing and said platen and an open position;

(b) a ram received in said horizontal passageway for movement therein between a first, feed position, and a second, material compression position, said ram having a platen secured at an end of same;

(c) fluid operated closing and locking means associated with said side wall sections for locking said side wall sections adjacent said housing and stationary platen where a baling chamber is partially defined by said stationary platen, bottom wall and side wall sections, said closing and locking mean comprising two pairs of interengageable locking elements, one of said elements of each pair being secured to one of said moveable side wall sections and the other of said elements of each pair being associated with a fluid operated cylinder and piston arrangement which is secured to the other of said side wall sections for movement of said interengageable element into and out of locking engagement with the other of said interengageable elements of said pair so that retraction of said pistons locks together said elements of each pair;

(d) a source of fluid power for operating said cylinder and piston arrangements; and

(e) means for controlling fluid power to said cylinders such that during closing of said side wall sections, a first of said cylinders only receives fluid whereby its interengageable elements only are brought into at least initial engagement, after which fluid power is automatically supplied to the other of said cylinders to initiate retraction of said piston therewithin, whereby said interengageable elements associated with said other of said cylinders may be easily, manually brought into initial engagement, and both of said cylinders may lock their respective interengageable elements.

4,412,411

PAPER SHEET BUNDLING APPARATUS

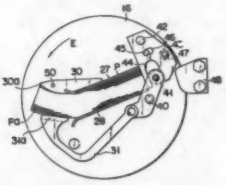
Yoshiro Hashimoto, and Shigeo Horino, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 133,940, Mar. 25, 1980, abandoned. This application Sep. 2, 1982, Ser. No. 414,313

Claims priority, application Japan, Mar. 28, 1979, 54-36730; Mar. 28, 1979, 54-36731; Mar. 28, 1979, 54-36732; Mar. 29, 1979, 54-37508; Mar. 29, 1979, 54-37509; Mar. 29, 1979, 54-37510; Mar. 29, 1979, 54-41038[U]

Int. Cl.³ B65B *11/04*

U.S. Cl. 53—587 **3 Claims**



1. A paper sheet bundling apparatus for a paper sheet processing system in which stacked paper sheets are bundled in a bundling position with a thermally fusible bundling tape during a bundling operation, said bundling tape having a leading end portion and a trailing end portion, said apparatus comprising:

a stationary frame;

a rotary body supported within said frame and rotatable about an axis from a normal position;

locating means provided within said rotary body and serving to locate the paper sheet stack in the bundling position, said locating means being disposed such that the leading end portion of the bundling tape is pushed by a leading end of the paper sheet stack when the paper sheet stack is fed into the bundling position, and then rests on an upper surface of the paper sheet stack;

paper sheet stack feed-in means for feeding the paper sheet stack into said locating means;

bundled paper sheet stack feed-out means for receiving the bundled paper sheet stack from said locating means after the bundling operation;

means for clamping the paper sheet stack in the bundling position;

means for moving the clamping means in a direction having a perpendicular component with respect to the direction of transfer of the paper sheet stack between a clamp position, at which the paper sheet stack is held in the bundling position, and a clear position at which the paper sheet stack is released, said clamping means rotating together with said rotary body during the bundling operation while in said clamp position;

heat receiving means, separate and independent from said clamping means, and having a back side surface and an upper surface, for holding the leading end portion of the bundling tape between the back side surface and the upper surface of the paper sheet stack, said heat receiving means being interposed between the paper sheet stack and the bundling tape wound around the paper sheet stack during the bundling operation;

means, separate and independent from said clamping means moving means, for moving said heat receiving means in a crosswise direction with respect to the direction of movement of said clamping means moving means and with respect to the direction of transfer of the paper sheet stack; and

heating means, facing the upper surface of said heat receiving member, for pressing the trailing end portion of the bundling tape to overlap and fuse with the tape wound around the paper sheet stack with said heat receiving means supporting the overlapped tape during the fusing operation.

4,412,412

LOADING DEVICE FOR FALSE-TWIST APPARATUS

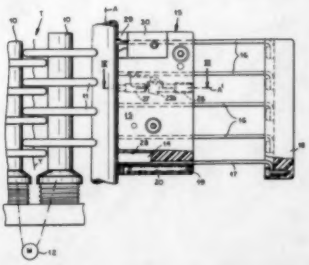
Günter Paul, Hammelburg; Kirit Patel, Elfershausen, and Günter Schmitt, Hammelburg, all of Fed. Rep. of Germany, assignors to Fag Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 182,649, Aug. 29, 1980, abandoned. This application Apr. 20, 1982, Ser. No. 370,052

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935380

Int. Cl.³ D01H *15/00*; D02G *1/08*

U.S. Cl. 57—280 **9 Claims**



1. In combination with a false-twist apparatus including:

a frame defining at least three generally parallel and radially spaced axes surrounding a central axially extending twist-

ing region and having at least one frame element having an abutment surface turned away from said region;

respective shafts lying on and journaled in said frame for rotation about the respective axes;

respective sets of axially spaced disks fixed on said shaft and having rims radially overlapping at said twisting region, whereby a yarn to be false-twisted can pass axially along said region in contact with said rims; and

drive means connected to said shafts for permanently connecting same together for joint rotation, whereby a yarn passing through said region is false-twisted by the rotating disks,

a thread-loading device comprising:

a support;

means including interengaging formations on said frame adjacent said abutment surface and on said support for releasably securing same together, said formations extending radially of said region, whereby said support can be fitted to said frame by being displaced radially toward said region to interfit said formations;

a loading arm carried on and displaceable relative to said support and having a yarn-pushing tip turned toward and engageable between said disks, said tip being displaceable with said arm between an outer position spaced from said disks and an inner position with said tip and a yarn engaged thereover in said region and axially between said disks;

means including a spring engaged between said support and said arm for urging same into one of said positions; and

a detent carried in said support and displaceable between a blocking position engaged with said arm in said outer position thereof for preventing movement of said arm relative to said support and a freeing position permitting such movement; and

release means linked to said detent and having a release element displaceable between a projecting position engageable with and depressable by said abutment surface when said formations are interfitted and a depressed position for displacing said detent into said freeing position only when said release element is in said depressed position, whereby said arm cannot move on said support unless said support is fitted snugly to said frame.

4,412,413

AIR CURRENT RECTIFIER FLATE ON AN AIR SPINNING DEVICE

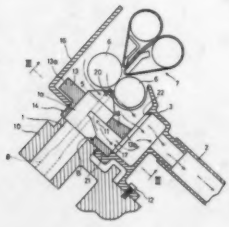
Shoji Sakai, Kyoto; Michiaki Fujiwara, Shinomachi; Nobunori Kubota, and Koshi Noda, both of Kyoto, all of Japan, assignors to Murata Machinery, Ltd., Japan

Filed Dec. 28, 1981, Ser. No. 335,220

Claims priority, application Japan, Oct. 13, 1981, 56-152716[U]

Int. Cl.³ D01H *11/00*

U.S. Cl. 57—304 **13 Claims**



1. An air current rectifier plate for use in an air spinning device characterized in that the rectifier plate is externally fitted on an air nozzle tip part which protrudes from a nozzle holder and includes a discharge port spaced from the tip of the nozzle, wherein the rectifier plate includes a lower part which is positioned between said air nozzle tip and the discharge port wherein at least a space communicating with the interior of a dust box disposed below said air nozzle tip part is substantially partitioned into two air flow paths separated by said lower part, one on the side of the air nozzle tip and the other for discharged air from the discharge port.

4,412,414

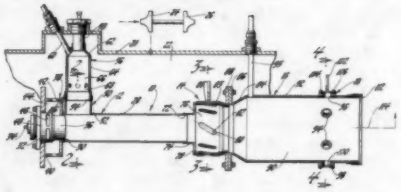
HEAVY FUEL COMBUSTOR

Allen S. Novick, Lafayette; Jerry G. Tomlinson, Indianapolis, and Dennis L. Troth, Speedway, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 22, 1980, Ser. No. 189,072

Int. Cl.³ F02C *1/00*

U.S. Cl. 60—39.23 **2 Claims**



1. In a high vapor temperature liquid fuel combustor, the combination comprising, a vaporizing tube of predetermined length and cross section having an inlet and an outlet, a fuel nozzle at said inlet connected to a source of said fuel and to a source of compressed air and operative to separate said fuel by air blast into a plurality of droplets and to direct a longitudinal stream of said droplets into said tube, a preheat combustor means operative to generate a preheat stream of heated products of combustion, means operative to direct said preheat stream into said tube generally at said inlet for interception of said droplet stream and mixture therewith whereby said mixture traverses said tube toward said outlet in a longitudinally moving swirl having a residence time in said tube proportional to said length and said cross section thereof and sufficient in duration for the heat from said preheat stream to vaporize said droplets without autoignition of said vapor, a primary air mixer connected to said tube outlet and to said compressed air source operative to combine said vaporized fuel and compressed air into a combustible mixture, first variable geometry means for regulating air flow into said primary air mixer thereby to control the equivalence ratio of said combustible mixture to reduce production of nitrous oxides, means defining a lean reaction zone for receiving said combustible mixture from said primary air mixer, means for igniting said mixture in said lean reaction zone to generate products of combustion, and second variable geometry means in a downstream portion of said lean reaction zone for regulating air flow from said compressed air source into said downstream portion to quench said products of combustion.

4,412,415

HYDROSTATIC STEERING GEAR

Svend E. Thomsen, Nordborg, and Erik Kyster, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 17, 1981, Ser. No. 234,778

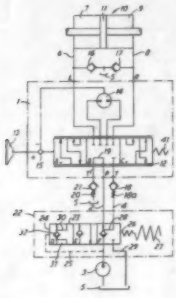
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006509

Int. Cl.³ F15B *7/00*; B62D *5/08*

U.S. Cl. 60—384 **7 Claims**

1. A hydraulic steering control system comprising a bidirectional servomotor having two operating ports on opposite

sides thereof, pump and tank means, a valve assembly including a metering unit, said valve assembly having a steering wheel connection and being connected to said servomotor and said pump and tank means, said valve assembly being operable to form fluid supply and exhaust branches for selectively feeding and exhausting opposite sides of said servomotor, said metering unit being in at least one of said exhaust branches, auxiliary valve means between said pump and tank means on



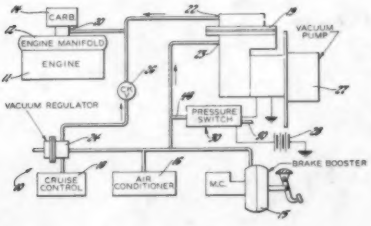
one side thereof, said auxiliary valve means having a normal operating position assumable upon being subjected to pump pressure to connect said fluid supply and exhaust branches to said pump and tank means, said auxiliary valve means having an emergency operating position assumable in the absence to pump pressure to connect said fluid supply and exhaust branches to permit fluid flow in said branches responsive to the manual actuation of said valve assembly.

4,412,416

ALTITUDE COMPENSATED VACUUM SUPPLY SYSTEM AND CONTROL

Robert M. Van House, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1980, Ser. No. 198,638
Int. Cl.³ F15B *15/18*
U.S. Cl. 60—397 **4 Claims**



1. An altitude compensated vacuum supply system for operating accessories of an automotive vehicle, said system comprising

a vacuum pump connected to at least one vacuum powered accessory device and drivable to provide vacuum for operating said device,

driving means connected with and selectively operable to drive the pump, and

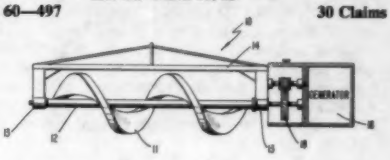
control means to operate the driving means only when the vacuum pressure falls below a predetermined control range of vacuum pressures adequate for operation of the accessory device but lying well below the pump vacuum pumping capability at sea level and declining at increasing altitudes at a rate less than that of the decline in pump vacuum capability, said control means being differentially responsive to ambient pressure and to vacuum pressure between the pump and accessory device and operatively connected to selectively operate the driving means.

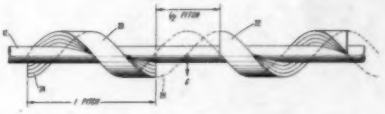
4,412,417

WAVE ENERGY CONVERTER

Daniel Dementhon, Annapolis, Md., assignor to Tracor Hydronautics, Incorporated, Laurel, Md.

Filed May 15, 1981, Ser. No. 263,886
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—497 **30 Claims**





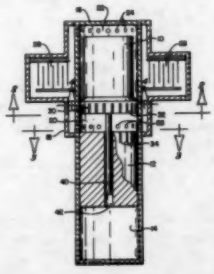
1. Apparatus for converting the energy of surface waves in a liquid comprising a buoyant mass rotatable around an axis of rotation, said buoyant mass comprising at least two similar helical volumes having a common axis coincident with said axis of rotation, said helical volumes being fixed for joint rotation about said axis, the position of one of said helical volumes being rotationally displaced about said axis with respect to the position of the other said helical volume.

4,412,418

HYDRODYNAMIC LUBRICATION SYSTEM FOR PISTON DEVICES PARTICULARLY STIRLING ENGINES

William T. Beale, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Continuation-in-part of Ser. No. 97,409, Nov. 26, 1979, Pat. No. 4,330,993. This application May 18, 1981, Ser. No. 265,030
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—520 **21 Claims**



1. An improved Stirling engine of the type having a dis-

placer piston and a power piston which reciprocate in cooperating cylinders confining a working fluid, said improvement being for hydrodynamically lubricating said pistons and comprising:

(a) means for spinning a first one of said pistons about its axis; and

(b) means for drivingly linking said first piston to said second piston to apply a torque to and spin said second piston.

4,412,419

FLUID SUPPLY SYSTEMS

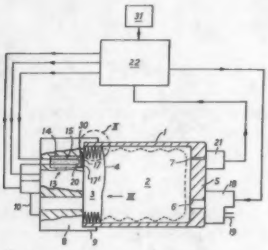
Alan V. Thomas, and Geoffrey E. Bone, both of Crowthorne, England, assignors to British Aerospace Public Limited Company, London, England

Continuation of Ser. No. 71,961, Sep. 4, 1979, Pat. No. 4,308,221. This application Sep. 25, 1981, Ser. No. 305,669

Claims priority, application United Kingdom, Sep. 18, 1978, 37221/78

Int. Cl.³ F01B *29/00*

U.S. Cl. 60—634 **29 Claims**



1. A fluid supply system comprising a chamber having a portion for containing a working fluid, a portion for containing a gas for pressurizing the working fluid, a movable partition separating the fluid portion from the gas portion of the chamber, an inlet for the gas and an outlet for the working fluid, a member operable to close the inlet and carrying solid propellant charge means, and ignition control means for the solid propellant charge means, characterized in that the solid propellant charge means comprise a plurality of individual charges, and in that the ignition control means is operable to ignite each charge as and when required to produce a pressurized gas which enters the gas portion of the chamber and moves the partition in the chamber to pressurize the working fluid and expel the same through the outlet, the ignition control means comprising pulse generating means, counter means responsive to the output of the pulse generating means, gate means responsive to the output of the counter means, and ignition circuits responsive to the respective outputs of the gate means, whereby the solid propellant charges are ignited serially.

4,412,420

EXPLOSIVE ACTUATED PIN PULLER

Mihai D. Patrichi, Los Angeles, and Delbert L. Evanson, Mission Hills, both of Calif., assignors to Networks Electronics Corp., Chatsworth, Calif.

Filed Jul. 3, 1980, Ser. No. 165,732

Int. Cl.³ F01B *29/08*

U.S. Cl. 60—635 **7 Claims**

1. An explosive actuated pin puller comprising:

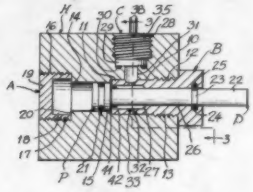
a piston including a head and a stem extending from the rear side thereof;

a housing defining a cylinder in which said head is slidable in an actuator stroke;

a slide bushing mounted in said housing, said bushing having a bore in which said stem is slidable in an actuating stroke, said bushing defining a passage extending along said stem to the back side of said head;

said bushing having in its outer end an internal O-ring groove, said stem having an external O-ring groove aligned with said bushing groove prior to projection;

a compressibly yieldable O-ring seated in said grooves and restraining said piston from projection prior to detonation of said cartridge; and



an ignition cartridge mounted in a side of said housing and communicating with said passage through a port extending radially of the axis of said piston;

said cartridge including detonative means for providing a quantity of compressed gas transmittable through said radially extending port and said passage, and active against the rear side of said piston head to project the piston in an actuative stroke.

4,412,421

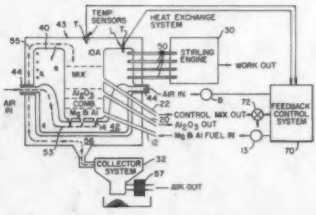
ENGINE OPERATED BY A NON-POLLUTING RECYCLABLE FUEL

E. Quimby Smith, Jr., Graeagle, Calif., assignor to Q Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 937,553, Sep. 1, 1978, Pat. No. 4,248,048, which is a continuation-in-part of Ser. No. 671,280, Mar. 29, 1976, Pat. No. 4,129,003. This application Feb. 2, 1981, Ser. No. 230,798

Int. Cl.³ F02G *1/04*

U.S. Cl. 60—643 **11 Claims**

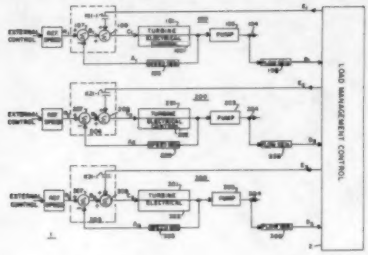


1. A system of operating an external combustion engine which is operated by a heated working fluid of the engine, comprising providing solid partcles of fuel selected from the group consisting of magnesium, aluminum, magnesium plus aluminum, magnesium-aluminum alloy, magnesium hydride, aluminum hydride and magnesium aluminum hydride, providing a combustion chamber in association with the engine, feeding said solid particles of fuel into said combustion chamber, establishing a fluidized bed of solid particles in said combustion chamber by introducing a flow of air and burning said fuel particles in the presence of the air, and heating the working fluid of the engine by the heat of the burning fuel.

4,412,422
APPARATUS AND METHOD FOR CONTROLLING A MULTI-TURBINE INSTALLATION

Anthony J. Rossi, Leominster, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Aug. 31, 1981, Ser. No. 298,272
Int. Cl.³ F01B *21/00*
U.S. Cl. 60—706 **8 Claims**



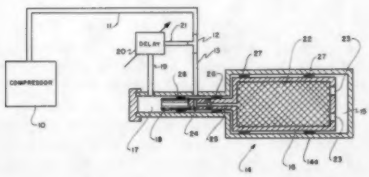
1. In a control apparatus for a multi-turbine installation, the combination comprising:
- a plurality of turbine-driven systems, each producing an output proportional to a respective control signal;
- means for generating a respective first error signal for each of said turbine-driven systems and proportional to any deviation of a respective first system-output indicating parameter from a respective predetermined reference value therefor;
- means for generating a respective second error signal for each of said turbine-driven systems and proportional to any deviation of a respective second system-output indicating parameter from a respective complementary portion of the combined second system-output indicating parameters of said systems; and
- means for generating the respective control signal for each of said turbine-driven systems and proportional to the sum of respective ones of said first and second error signals,

whereby a predetermined relationship of the individual outputs of said turbine-driven systems is maintained.

4,412,423
SPLIT-CYCLE COOLER WITH IMPROVED PNEUMATICALLY-DRIVEN COOLING HEAD

Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 16, 1982, Ser. No. 388,766
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **2 Claims**



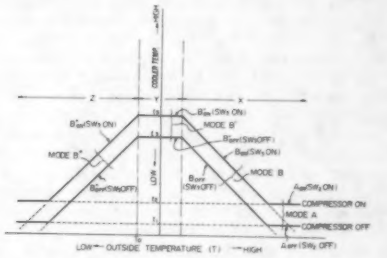
1. A split-cycle cryogenic cooler system including a compressor which provides a pressure wave in said system, a displacer piston assembling, a cryogenic fluid conduit means between said compressor and said assembly, with a cryogenic fluid in said compressor, said assembly, and said conduit means, wherein the improvement comprise:

said displacer piston assembly has an expansion space and pneumatic space in communication with said fluid conduit means, wherein said fluid conduit means includes:
- first and second fluid conduits respectively connected to said expansion space and to said pneumatic space to conduct respectively first and second portions of said pressure wave;
- a fluidic delay in said first fluid conduit whereby said first portion of said pressure wave leads in time or phase the second portion of said pressure wave.

4,412,424
AIR CONDITIONING SYSTEM FOR PREVENTING FOGGING OF VEHICLE WINDOWS

Katumi Iida; Shinji Sutoh, and Toshizo Hara, all of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 334,054
Claims priority, application Japan, Dec. 29, 1980, 55-188692
Int. Cl.³ F25B *41/00*; B60H *1/00*
U.S. Cl. 62—209 **5 Claims**



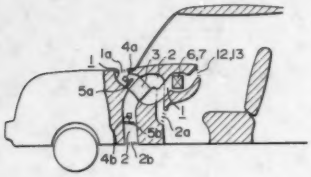
1. An air conditioning system for controlling a temperature in an enclosure comprising:
- a cooler for discharging cooled air into the enclosure;
- a cooler temperature sensor for sensing a temperature of the cooler;
- an outside temperature sensor for sensing a temperature outside the enclosure; and
- operation control means for turning the cooler on and off, said operation control means being constructed to compute a control on temperature and a control off temperature as predetermined functions of the cooler temperature and the outside temperature, turn the cooler on when the cooler temperature is higher than the control on temperature, and turn the cooler off when the cooler temperature is lower than the control off temperature;

said operation control means being further constructed to change said control on and off temperatures to different levels such that the control on and off temperatures increase as the outside temperature decreases and when the outside temperature is above a first predetermined temperature, the control on and off temperatures are maintained constant at upper limits when the outside temperature is varied between the first predetermined temperature and a second predetermined temperature which is lower than the first predetermined temperature, and the control on and off temperatures decrease as the outside temperature further decreases and when the outside temperature is below the second predetermined temperature.

4,412,425
AIR CONDITIONING AND VENTILATION SYSTEM

Akira Fukami, Okazaki; Hiroki Noguchi, Oobu, and Kunio Okamoto, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 4, 1981, Ser. No. 327,615
Claims priority, application Japan, Dec. 9, 1980, 55-174055; Feb. 18, 1981, 56-22807
Int. Cl.³ B60H *3/04*
U.S. Cl. 62—244 **7 Claims**



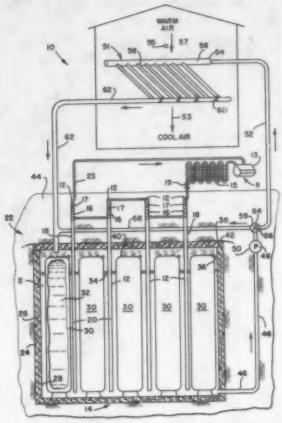
1. An air conditioning and ventilation system for vehicles, comprising a first passage for introducing outdoor air into the passenger compartment of a vehicle, a second passage for guiding room air from said passenger compartment to the outside of said vehicle, said first and second passages intersecting at a point, a heat exchanger disposed at said intersection of said passages to exchange the actual heat and the latent heat of the airs flowing through said first and second passages, first and second auxiliary passages respectively connecting sections of said first passage downstream of said heat exchanger to sections of said second passage upstream of said heat exchanger, first and second dampers for controlling the communications of said sections of said first passage through said first and second auxiliary passages with said sections of said second passage, respectively, the arrangement being such that, when said first and second dampers are moved to positions in which said first and second auxiliary passages are opened, the room air entering said second passage bypasses said heat exchanger and flows through said first auxiliary passage into said first passage downstream of said heat exchanger and thus into said passenger compartment and the outdoor air entering said first passage flows through said heat exchanger into said second auxiliary passage from which the outdoor air is again introduced into and flows through said heat exchanger into said second passage and is discharged therefrom into the atmosphere.

4,412,426
WISER COOLING SYSTEM

Shao W. Yuan, 6701 Montour Dr., Falls Church, Va. 22043

Continuation-in-part of Ser. No. 218,800, Dec. 22, 1980, Pat. No. 4,346,569, which is a continuation-in-part of Ser. No. 951,518, Oct. 13, 1978, Pat. No. 4,240,268. This application Jun. 23, 1981, Ser. No. 276,648
Int. Cl.³ F25D *23/12*
U.S. Cl. 62—260 **5 Claims**

1. A system for storing and utilizing cold, said system (10,25) including a chamber (22), insulating means surrounding said chamber, an anti-freeze liquid (2) contained within said chamber, water container means (30) immersed in said anti-freeze liquid and being at least partially filled with water (32), refrigeration means (11) for cooling said anti-freeze liquid below the freezing point of water so that water (32) within said container means (30) changes phase from liquid to solid; said refrigeration means (11) including a compressor (13), a condenser (15), cooling coils (17, 21), and a refrigerant contained therein for removing heat from said anti-freeze liquid; and heat exchange means (51) including first pipe means (46, 52) for passing said anti-freeze from said chamber (22) to said heat exchanger means, second pipe means (62) for returning said anti-freeze liquid from said heat exchanger means to said chamber (22),

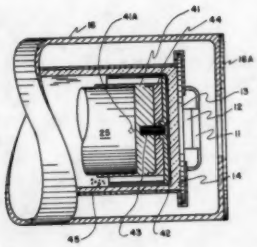


and pump means (50) for circulating said anti-freeze liquid in said pipe means and said heat exchanger means.

4,412,427
NONCONTACT THERMAL INTERFACE

Stuart B. Horn, Fairfax; Lundy H. McMillion, Fredericksburg; Howard L. Dunmire, Stafford; Geoffrey S. Sawyer, Annandale, and William C. Gerkin, Vienna, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 137,073, Apr. 3, 1980, Pat. No. 4,324,104. This application Nov. 30, 1981, Ser. No. 326,094
Int. Cl.³ F25D *19/00*
U.S. Cl. 62—298 **5 Claims**



1. In a thermal viewer apparatus having a solid state detector mounted on the inside surface of the end wall of an exterior well in an evacuated dewar and a cooler with a cold finger extending into said well, the improvement comprising:

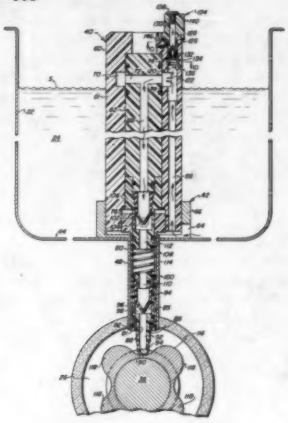
a heat exchange coupling member formed in the shape of a cup, with both the inner and outer configurations thereof similiarly shaped, for coupling the cold finger of the cooler to the inside bottom and end-wall portion of the external well of the dewar, wherein the inner portion of the cup-shaped coupling member fits over the cold finger of the cooler and wherein the cold finger with the cup-shaped member attached fits into the exterior well of the dewar, wherein the outer surface of the cup-shaped member substantially conforms to the size and shape of the inner dimensions of the exterior well of the dewar.

4,412,428

APPARATUS FOR PRODUCING AND DISPENSING AN AERATED FROZEN CONFECTION

Frank Giannella, Hawthorne, and Enzo E. Pellicciari, Cliffside Park, both of N.J., assignors to Coldelite Corporation of America, Lodi, N.J.

Filed Jun. 3, 1981, Ser. No. 269,998
Int. Cl.³ A23G 9/20
U.S. Cl. 62—308 17 Claims



1. In an apparatus for producing and dispensing an aerated frozen confection, the apparatus having a reservoir for holding a supply of liquid ingredients to be frozen, a pump assembly for pumping the liquid ingredients from the reservoir and air to be mixed with the liquid ingredients, a freezer compartment for receiving the mixture of liquid ingredients and air from the pump assembly and freezing the mixture, a dispenser communicating with the freezer compartment for selectively dispensing the aerated frozen confection by means of pressure within the freezer compartment, and an agitator within the freezer compartment for agitating the mixture within the freezer compartment, the improvement in which the pump assembly comprises:

a pump housing;

a conduit within the pump housing, the conduit having an inlet end communicating with the reservoir, an outlet end communicating with the freezer compartment, and a pump cavity within the conduit intermediate the inlet end and the outlet end;

a pumping member mounted for longitudinal reciprocation within the pump cavity through a suction stroke and a feed stroke, the pumping member having an internal passage extending generally longitudinally, essentially parallel to the direction of reciprocation of the pumping member and along a path of flow of mixture from the pump cavity to the outlet end of the conduit;

a first check valve placed in the path of flow, and a second check valve placed within the conduit, between the inlet end of the conduit and the first check valve, such that mixture will be drawn through the second check valve into the pumping cavity during the suction stroke of the pumping member and then will pass through the first check valve to be discharged at the outlet end during the feed stroke of the pumping member;

air metering means in the pump housing and communicating with the conduit between the inlet end of the conduit and the second check valve for passing a metered amount of air into the conduit in response to movement of the pumping member during the suction stroke; and

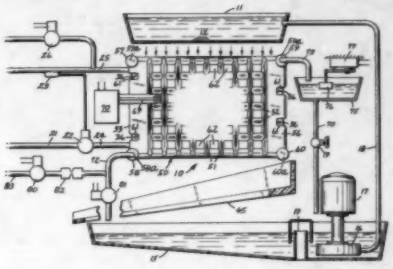
pressure regulating means in the pump housing for limiting the pressure within the freezing compartment to a predetermined maximum pressure.

4,412,429

ICE CUBE MAKING

Vance L. Kohl, New Hope, Minn., assignor to McQuay Inc., Minneapolis, Minn.

Filed Nov. 27, 1981, Ser. No. 325,200
Int. Cl.³ F25C 1/04
U.S. Cl. 62—347 12 Claims



1. Ice making apparatus, comprising:

an evaporator member having an outer surface and having an inner passageway for conducting refrigerant fluid;

a jacket member at least partially enclosing said evaporator member, said jacket having internal passageways and having external sites cooled by said evaporator member for forming ice cubes or particles and including a plurality of intersecting ridge portions whose inner surfaces form portions of said internal passageways, and whose outer surfaces form the side walls for the sites for forming said ice cubes;

means for supplying cooling refrigerant to said evaporator member and for applying water to the outside of said jacket across said sites in a freezing mode of operation; and

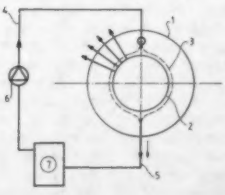
means for introducing water into said internal passageways of said jacket during an ice harvest mode of operation to uniformly warm the ice cubes or particles formed on said jacket at said sites to free them from said jacket.

4,412,430

INFLATABLE-STRUCTURE APPARATUS FOR COOLING A HEAT EXCHANGE FLUID

Claude Leroy, Marseilles, France, assignor to Sorelec, Loiret, France

Filed Jun. 2, 1982, Ser. No. 384,370
Claims priority, application France, Aug. 24, 1981, 81 16185
Int. Cl.³ F25B 23/00
U.S. Cl. 62—467 R 4 Claims



1. An apparatus for cooling a heat exchange fluid, comprising a first inflatable, flexible, cylindrical casing of plastic material which is permeable to infra-red rays, said casing being

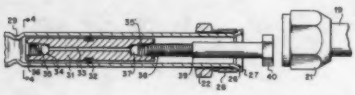
maintained in its cylindrical form by an increased internal pressure, a wall means disposed within said casing, said wall means being reflective in the direction of said casing and over which flows the heat exchange fluid to be cooled, a supply duct for supplying the heat exchange fluid to the interior of said casing and a discharge duct for removing the heat exchange fluid from the interior of said casing.

4,412,431

AUTOMOTIVE AIR CONDITIONER EXPANSION TUBE UNIT

Henry D. Waldrep, 906 S. Third St., Celina, Tex. 75009

Filed Sep. 29, 1981, Ser. No. 306,816
Int. Cl.³ F25B *41/06*
U.S. Cl. 62—511 **3 Claims**



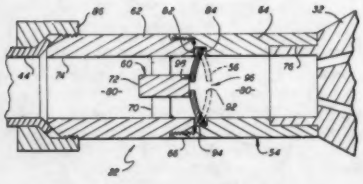
1. An end to end reversible expansion tube unit used in air conditioning systems comprising: a body having an axially extended circular bore therethrough communicating at each end with an enlarged diameter internally threaded bore chamber; and a tool for insertion and removal of said expansion tube unit including: a bolt unit having a shank with a threaded section threadable into corresponding threads of the enlarged diameter internally threaded bores, said shank extended to turning means thereof for manually thread turn engaging and unthread turn disenengaging said tool from said threaded bores.

4,412,432

REFRIGERATION SYSTEM AND A FLUID FLOW CONTROL DEVICE THEREFOR

Thomas E. Brendel, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,829
Int. Cl.³ F25B *39/02*
U.S. Cl. 62—504 **6 Claims**



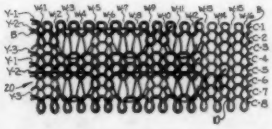
1. A refrigeration system comprising:
a compressor, a condenser, expansion means, and an evaporator including first and second evaporator circuits;
means to vary the capacity of the refrigeration system; and
refrigerant flow means connecting the compressor, the condenser, the expansion device, and the evaporator together to form a closed loop, vapor compression refrigeration circuit and including
first evaporator inlet line means for conducting refrigerant to the first evaporator circuit, and including a refrigerant flow control device for controlling vapor flow through the first evaporator inlet line means, and
second evaporator inlet line means for conducting refrigerant to the second evaporator circuit;
wherein the refrigerant flow control device comprises
a tubular body defining a body inlet, a body outlet, a fluid flow passage axially extending therebetween, and first and second axially spaced apart shoulders,
a Belleville spring positioned within the fluid flow passage, and including an inside edge defining a spring port for conducting fluid flow through the Belleville spring, and an outside edge annularly extending in a close fit with the surfaces of the body and axially located and held between the first and second shoulders, and
stop means defining a stop surface disposed within the body and completely overlying the spring port,
the Belleville spring having a first position, where the inside edge of the Belleville spring engages the stop surface to close the spring port and prevent fluid flow therethrough, and a second position, where the inside edge of the Belleville spring is spaced from the stop surface to allow fluid flow through the spring port, and
the Belleville spring being actuated from the first position to the second position by a predetermined fluid pressure force acting thereon.

4,412,433

PANTYHOSE WITH INTEGRALLY KNIT CROTCH AREA

Sam C. Safrit, Pfafftown; Edward I. Cassidy, and Melvin C. Euliss, both of Burlington, all of N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

Filed Sep. 8, 1981, Ser. No. 300,035
Int. Cl.³ A41B *9/04*
U.S. Cl. 66—177 **4 Claims**



1. A pantyhose including a panty portion, and integrally knit leg and foot portions, said panty portion being knit of a hydrophobic body yarn in every course, said body yarn being stretchable and providing stretchability and smooth conforming fit characteristics to said panty portion, said panty portion including an integrally knit crotch area characterized by ventilating and moisture-absorbing characteristics, said crotch area comprising a plurality of course portions, said course portions of said crotch area including a repeating four-course pattern comprising a first course portion of jersey stitches of said body yarn in every wale and with an additional yarn knit in plated relationship with said body yarn in every wale, a second course portion of jersey stitches of said body yarn in every wale and with an additional hydrophobic yarn knit in plated relationship with said body yarn in adjacent pairs of spaced-apart wales and floating inside of multiple wales between said selected spaced-apart wales, a third course portion of pairs of adjacent jersey stitches and alternating with two-wale tuck loops knit only of said body yarn, and a fourth course portion of jersey stitches of said body yarn in every wale and with a hydrophilic yarn knit

in plated relationship and on the inside of said body yarn, said repeating course portions with alternating jersey stitches and two-wale tuck loops of said body yarn providing openings in said crotch area to provide ventilation thereto, said second and third course portions including wales of jersey stitches knit of said body yarn only and positioned between pairs of said two-wale tuck loops at said multiple wales to provide plural wales of said body yarn only between the openings provided by said two-wale tuck loops, and said repeating course portions with said hydrophilic yarn on the inside providing moisture-absorbing characteristics to said crotch area.

4,412,434

APPARATUS FOR THE DYEING AND FIXING OF KNITTED ARTICLES OF CLOTHING

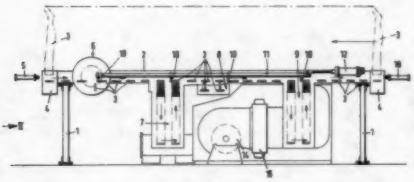
Willi Witte, Gevelsberg, and Wulf Böing, Hagen, both of Fed. Rep. of Germany, assignors to Dr. Böing GmbH & Co. Anlagen und Maschinen KG, Hagen, Fed. Rep. of Germany

Division of Ser. No. 191,473, Sep. 26, 1980, Pat. No. 4,365,373. This application Jul. 28, 1982, Ser. No. 402,707

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940267

Int. Cl.³ D06B *3/30*

U.S. Cl. 68—3 R **9 Claims**



1. In an apparatus for continuous dyeing and fixing of articles of clothing having fibers and comprising knitted socks, stockings, panty hose or similar knitted articles of clothing of highly elastic material, having individual treatment stations for at least dyeing, fixing, and drying and having a plurality of flat forms onto which the articles of clothing to be treated are pulled and which are movable by means of a transportation device through the individual treatment stations between a pulling-on station and a pulling-off station, the improvement wherein

the flat forms are plate-shaped and are arranged on the transportation device relative to the horizontal by at most an angle of 25 degrees,

the flat forms are elongated defining a lengthwise direction of the articles of clothing,

said transportation device includes means for continuously passing said flat forms fixed, in a non-rotatable orientation with a flat side of the forms lying substantially parallel to the ground with respect to a longitudinal axis as well as a transverse axis of the flat side, through the individual treatment stations with the articles of clothing thereon and with the fibers of the articles of clothing extending in the lengthwise direction of the articles of clothing, with each of said forms being separated from each other and parallel to each other.

4,412,435

CONTINUOUS LAUNDERING APPARATUS

Paul H. Gallagher, 2530 Crawford Ave., Evanston, Ill. 60201

Continuation-in-part of Ser. No. 141,952, Apr. 21, 1980, Pat. No. 4,361,018. This application May 5, 1982, Ser. No. 374,932

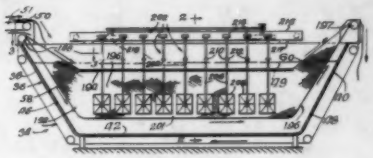
Int. Cl.³ D06F *15/00, 31/00*

U.S. Cl. 68—22 R **17 Claims**

1. Laundering apparatus comprising,

a tank for holding laundering water and having an inlet end and an outlet end,

conveyor means for positively conveying goods continuously from the inlet end through the tank through an operating range and through laundering water therein to the outlet end,



the conveyor means including an endless belt of open-work material, and being of a single piece and surrounding and enclosing the goods, and

agitating means operative for engaging the conveyor means and thereby agitating the goods in the conveyor means.

4,412,436

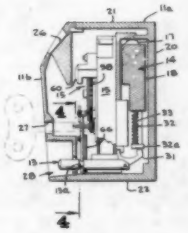
TIME LOCK WITH ANTI-SHOCK FEATURES

Charles G. Bechtiger, La Chaux-de-Fonds, Switzerland, assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Jun. 16, 1981, Ser. No. 274,273

Int. Cl.³ E05B *43/00*

U.S. Cl. 70—272 **29 Claims**



1. A time lock for bank vault doors and the like having the door bolting mechanism including a snubber bar, comprising a lock case, a plurality of timer units of the settable dial type mounted in said case, a blocking member in said case movable between blocking and release positions relative to said snubber bar, an elongated plunger movable longitudinally rearwardly and forwardly of the case connected to means for holding the blocking member in blocking position and releasing it therefrom, each of the timer units having a rotatable time-lapse indicating dial and clockwork mechanism intercoupled therewith including manual setting means for rotating the dial to the desired time-lapse indication and a trip member associated with the dial for a effecting release of the blocking member when the dial reaches zero time position, an abutment bar forwardly spanning the timer units having abutments to be engaged by the respective trip members when the associated timer dial reaches zero time position for moving the abutment bar through a release stroke, a latch lever pivotally supported for movement in a plane transversely intersecting the plunger and coupled to the abutment bar, the plunger having a latching recess defining a restraining shoulder located at the transverse plane when the plunger is positioned to dispose the blocking member in blocking position, the latch lever having a latching toe interfitting in said latching recess to abut said restraining shoulder and releasibly retain said plunger in said last-mentioned position, a second lever coupled to said abutment bar defining a parallelogram type linkage therewith in coaction with said latch lever, and means at the pivotal coupling between said abutment bar and said latch lever for fine adjustment of the angular position of the latch lever relative to the

abutment bar to thereby adjust the time of release stroke movement of the abutment bar by the timer trip members.

4,412,437

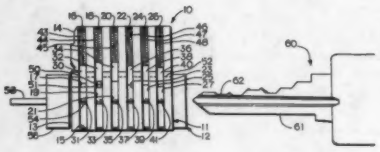
REKEYABLE LOCK METHOD AND APPARATUS

Jerry R. Smith, Littleton, Colo., assignor to Innovative Research Corporation, Littleton, Colo.

Continuation-in-part of Ser. No. 327,787, Dec. 7, 1981. This application Sep. 23, 1982, Ser. No. 422,027

Int. Cl.³ E05B *25/00, 35/08*

U.S. Cl. 70—338 **3 Claims**



1. In rekeyable lock apparatus, including a lock cylinder housing with a cylindrical bore extending longitudinally therethrough an elongated top pin chamber in said housing perpendicular to and extending radially outward from said cylindrical bore, a cylindrical core positioned rotatably in said bore, said core having a longitudinal keyway therein for receiving a key bit and a bottom pin chamber extending radially inward from the peripheral surface thereof into said keyway, said bottom pin chamber being adapted to axially align with said top pin chamber, a top tumbler pin slideably positioned in said top pin chamber and a bottom tumbler pin slideably positioned in said bottom pin chamber, said core being rotatable when the interface between said top and bottom pins is aligned with the shear plane between the core and the cylinder housing and not being rotatable where a pin is positioned through said shear plane, the improvement comprising:

a disc-shaped spacer member positioned in said bottom pin chamber between said top pin and said bottom pin for providing an additional interface between said top and bottom pins adapted for alignment with the shear plane between said core and said cylinder housing, one interface being on the top of said spacer means and a second interface being on the bottom of said spacer means, said spacer member having a diameter less than said top tumbler pin, and

removal means for removing said spacer means from said pin chamber and ejecting it out of said lock apparatus, said removal means including an elongated key bit adapted for insertion into said keyway and having a bitting thereon adapted to position said spacer member in said top pin chamber with said second interface between said spacer member and said bottom pin aligned with the shear plane between said core and said cylinder housing such that said core can be rotated within said cylinder housing, said key bit also having a cut therein opposite said bitting and of a depth corresponding to the thickness of said spacer member and a length less than said top tumbler pin and greater than said spacer member, said cut being adapted to receive said spacer member therein when aligned with said top pin chamber and to carry said spacer member out of said core when said key bit is withdrawn from the core with the spacer member in said cut.

4,412,438

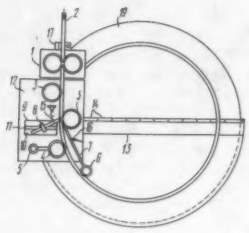
PIPE BENDING MACHINE

Vladimir M. Tjushevsky; Vladimir E. Ermakov; Fikrat S. O. Seidaliev; Gennady A. Sjusin; Igor I. Dobkin, and Jury V. Krasovsky, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchnoissledovatelsky, Proektny I Konstruktorsky Institut Splavov I Obrabotki Tsvetnykh Metallov "Giprotsvetmetobrabotka", U.S.S.R.

Filed Jul. 24, 1981, Ser. No. 286,686

Int. Cl.³ B21D *7/08, 7/14;* **B21F** *3/02*

U.S. Cl. 72—10 **7 Claims**



1. A pipe bending machine, comprising

pipe feeding means for feeding incoming pipe;

a pipe bending device including a bending roller for bending said pipe

drive means coupled to said pipe bending device for displacing said bending roller in a plane of pipe bending;

a two-arm lever having a pivot axis intersecting the center line of said incoming pipe;

a follow-up roller mounted on one arm of said lever and contacting said pipe after said pipe has been subjected to the action of said bending roller;

said drive means having a movable contact mounted on the other arm of said lever for displacing said bending roller, said movable contact being movable about the axis of said other arm and two stationary contacts for displacing said bending roller, said stationary contacts alternately making electrical contact with said movable contact; and

a coil carrier for accommodating a coil of bent pipe.

4,412,439

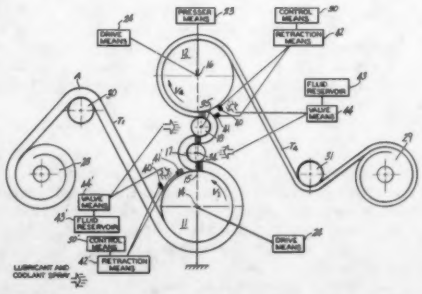
COOPERATIVE ROLLING MILL APPARATUS AND PROCESS

William L. Brenneman, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 4, 1981, Ser. No. 260,491

Int. Cl.³ B21B *45/02*

U.S. Cl. 72—41 **42 Claims**



1. A rolling mill apparatus for reducing metal or metal alloy strip thickness comprising:

a plurality of roll bites, each of said roll bites causing a reduction in said strip thickness as said strip passes through said mill;

each said roll bite being formed by adjacent rolls between which said strip passes, each said roll having a coefficient of friction;

means for providing a forward tension to said strip as said strip passes through said mill; and

means for creating a first differential friction force between at least said adjacent rolls of a most downstream one of said roll bites, but not between said adjacent rolls of at least one other of said roll bites, for causing a reduction in said forward tension, said differential friction force means including means for changing the coefficient of friction between a first of said adjacent rolls of said most downstream roll bite and said strip.

4,412,440

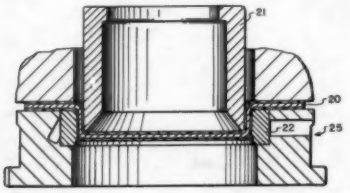
PROCESS FOR MAKING CONTAINER

Thomas L. Phalin, Cary, and James J. Ulmes, Palatine, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Feb. 13, 1981, Ser. No. 234,451

Int. Cl.³ B21B *45/00*

U.S. Cl. 72—46 **10 Claims**



1. A method of making a hollow cylindrical container open at one end and closed at the other from a thin sheet of metal including the following steps:

blanking a thin circular preform from metal precoated on the major surfaces thereof, said circle having a diameter about twice the ultimate diameter of the container and then immediately in a first operation concurrently drawing and ironing said preform into a shallow cup by drawing said preform to conform to the draw punch so that a diameter approximately twice its height is achieved and immediately thereafter ironing said drawn portion between said draw punch and an ironing portion of the draw die, and then concurrently redrawing and reironing said shallow cup in a second operation where said concurrent redrawing and ironing is performed apart from out of axial alignment with said first operation to reduce the diameter and side wall thickness of said cup during said second concurrent operation such that its height and diameter are about equal after redrawing said shallow cup to conform to the redraw punch and immediately ironing said redrawn portion between said redraw punch and an ironing portion of the redraw die and finally concurrently redrawing and reironing same in a third operation performed apart from out of axial alignment with said other operations to produce said ultimate diameter of said container being approximately 75% of its height and its side wall thickness slightly thinner than the thickness of said thin circular preform by again redrawing said redrawn cup to conform to said redraw punch and immediately ironing said redrawn portion between said redraw punch and an ironing portion of the redraw die.

4,412,441

METHOD FOR FORMING AN ENLARGED FLANGED HOLE IN A CURVED SURFACE

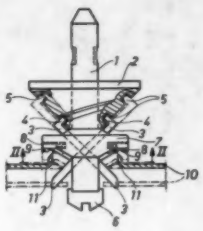
Leo Larikka, Vaasa, Finland, assignor to G. A. Serlachius Oy, Mantta, Finland

Division of Ser. No. 226,869, Jan. 21, 1981. This application Sep. 17, 1982, Ser. No. 419,126

Claims priority, application Finland, Jan. 30, 1980, 800278

Int. Cl.³ B21D *21/00, 53/00;* B23B *35/00*

U.S. Cl. 72—71 **4 Claims**



1. A method of forming a flanged hole in a curved surface comprising the steps of:

forming an initail generally circular hole in said surface;

enlarging said initial hole into a larger oval hole with a conical cutting surface to form an edge surface of said hole of frusto conical shape;

turning the edge region around said enlarged oval hole outwardly to form a surrounding flange with a free outer edge lying substantially in a common plane; and

shaping said outwardly turned free edge.

4,412,442

METHOD FOR BENDING A METAL PIPE

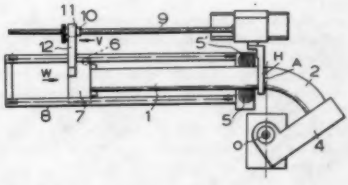
Shumpei Kawanami, Hiratsuka; Yasuo Watanabe, Kitakyushu, and Susumu Hanyo, Yokusuka, all of Japan, assignors to Dai-Ichi High Frequency Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 188,052

Claims priority, application Japan, Sep. 21, 1979, 54/120833

Int. Cl.³ B21D *7/16*

U.S. Cl. 72—128 **8 Claims**



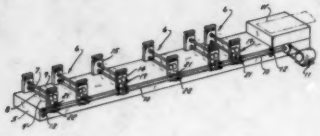
1. In the method of hot bending a metal pipe in which the pipe is passed through a heating zone in a heating/cooling unit while a bending movement is applied and thereafter through a cooling zone in the heating/cooling unit adjacent to the heating zone, and in which the radius of curvature of the bend is larger than the desired radius in the initial and terminal (relatively smaller angle) portions of the bend and greater than the desired radius in the relatively larger angle intermediate portion of the bend, the improvement in which the temperature of the pipe while in the heating zone is maintained a constant.

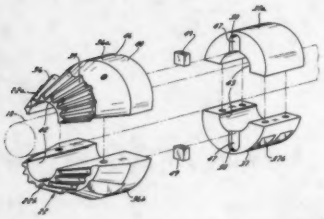
4,412,443

ROLLER FORMING MACHINE WITH LENGTHWISE ADJUSTABLE HEADS

Herbert M. Stoehr, New Berlin, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Jul. 30, 1981, Ser. No. 288,468
Int. Cl.³ B21D 5/08
U.S. Cl. 72—181 **9 Claims**





1. A roller forming machine comprising an elongated frame and a plurality of forming heads spaced at intervals along said frame, each forming head comprising a stand that supports a pair of laterally extending roller shafts on which forming rollers are carried and transmission means for rotatably driving said roller shafts, said machine being characterized by:

A. cooperating detachable securement means on said frame and on the stand of at least one forming head for securing said stand to the frame at any selected one of a plurality of locations along the length of the frame;

B. a rotatable line shaft extending lengthwise along one side of the frame past said locations;

C. a driven bevel gear on said one forming head for rotatably driving its roller shafts through its transmission means, said bevel gear having its axis parallel to the axis of the roller shafts; and

D. a bevel pinion securable to said line shaft at any selected one of said locations, for transmitting rotation of said line shaft to said driven bevel gear, said bevel pinion comprisng

(1) a pinion member having a concentric bore therethrough of a diameter to closely slidably fit said line shaft and having a concentric frustoconical front face on which there are teeth for meshing engagement with teeth on said driven bevel gear, said pinion member comprising

(a) two pinion member parts separable from one another on a plane containing the axis of the pinion member and

(b) a screw extending across said plane and normally connecting said parts;

(2) a collar member comprising

(a) complementary collar parts engageable with the line shaft at opposite sides thereof and which together embrace less than the whole circumference of the line shaft, and

(b) screw means normally connecting said collar parts for clamping securement of the collar member to the line shaft rearwardly adjacent to the pinion member; and

(3) abutment means on a front of said collar member and on a rear of said pinion member

(a) defining opposed eccentric surfaces on the respective members that face substantially circumferentially and

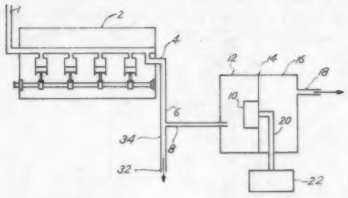
(b) providing a connection between said members whereby they are confined substantially only against rotation relative to one another to thus accommodate a range of positions of the collar parts circumferentially relative to one another and radially relative to the axis of the pinion member.

4,412,444

METHOD FOR DETECTION OF HYDROCARBONACEOUS FUEL IN A FUEL INJECTION ENGINE

William E. Ketel, II, Royal Oak, Mich., assignor to Sun Electric Corporation, Crystal Lake, Ill.

Filed Dec. 29, 1981, Ser. No. 335,348
Int. Cl.³ G01N 27/12
U.S. Cl. 73—23 **10 Claims**



1. A method for detecting the presence of hydrocarbonaceous fuel in the fuel injection flow through the fuel line to the cylinders of a fuel injection engine comprising the steps of:

(a) diverting a portion of the flow through the fuel line into a sample tube;

(b) reducing the rate of flow of the diverted portion to a rate of 3–6 feet/second;

(c) passing the reduced flow over a sensor of the type comprising a fuel vapor sensitive semiconductor having a signal output proportional to the quantity of fuel vapor in the flow;

(d) providing means for monitoring the sensor signal including a programmable controller; and

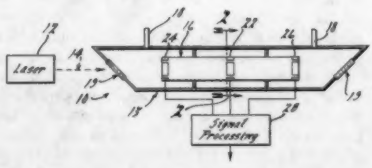
(e) monitoring quantitatively the sensor signal change to detect the presence and amount of said hydrocarbonaceous fuel.

4,412,445

RESONANT SPECTROPHONE SYSTEM NOISE ELIMINATION

Robert L. Spellicy, Las Cruces, N. Mex., assignor to OptiMetrics, Inc., Ann Arbor, Mich.

Filed Aug. 27, 1981, Ser. No. 296,774
Int. Cl.³ G01N 29/02
U.S. Cl. 73—24 **8 Claims**



1. In a spectrophone system wherein radiant energy from a radiant energy source is directed into a chamber containing a fluent sample with respect to which certain absorption data is

to be obtained in the presence of background noise by detecting pressure variations within the chamber and generating a signal containing both absorption data and noise components, the radiant energy having a component corresponding to an absorption characteristic of the fluent sample which is being investigated and said chamber having a geometry allowing a resonant wave to be established in the chamber, the improvement for significantly attenuating the noise component relative to the absorption data component which comprises means of creating a resonant wave in the chamber by excitation from the radiant energy source, means for monitoring pressure variations at a location within the chamber corresponding to a peak of the resonant wave to develop a corresponding peak signal containing both true absorption data and noise components, means for monitoring pressure variations at a location within the chamber corresponding to a nodal point of the resonant wave and generating a corresponding nodal signal representing background noise, and means for modifying the peak signal by the nodal signal to remove the noise component from the peak signal and yield a true absorption data signal.

4,412,446

OPTICAL COMBUSTION SENSOR, PARTICULARLY FOR USE WITH INTERNAL COMBUSTION ENGINES

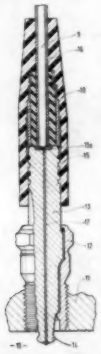
Ernst Linder, Mühlacker; Helmut Maurer, Vaihingen; Klaus Müller, Tamm, and Helmut Reum, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,408

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110996

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **19 Claims**



1. Optical sensor arrangement to obtain an optical signal representative of combustion light in a combustion chamber (**10**), particularly a combustion chamber of an internal combustion engine, having

an tubular housing (**12**) formed with means for securing the housing in a wall (**11**) defining said combustion chamber at one side thereof;

light-responsive means (**9**, **9***a*) retained in the housing;

and light pick-up means (**13**, **20**, **22**, **26**) retained in the housing having a sensing end portion in communication with the combustion chamber at one end and being optically coupled to the light responsive means at the other end,

and wherein, in accordance with the invention,

the sensing end portion of the light pick-up means is mushroom-shaped and formed with an enlarged thickened head (**14**) at the terminal end.

4,412,447

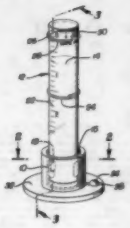
DISPOSABLE IRRIGATION GAUGE

Walter C. McMahan, Rte. 6, Box 2115, Escondido, Calif. 92025

Filed Jul. 23, 1981, Ser. No. 286,177

Int. Cl.³ G01F *23/02*

U.S. Cl. 73—73 **3 Claims**



1. An irrigation gauge for use in an agricultural field comprising:

(a) a cup having a rim;

(b) a hollow translucent tube for containing water, said tube being closed at one end and open at the other end;

(c) means determining a fitted relationship between the cup and the open end of the tube;

(d) said tube and cup determining a space between them at the region of the cup rim for containing water exposed to the environment,

(e) said hollow tube having a lateral opening providing access for passage of air into the tube and allowing water in the tube to drop, thereby replenishing said space upon evaporation and/or transpiration of water therefrom;

(f) means cooperable with the change in the level of water in the tube to indicate the amount of moisture loss in the field.

4,412,448

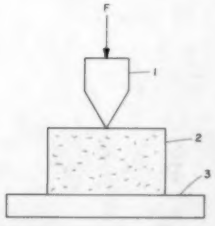
BLOCKING TEST FOR CHLORINATED POLYETHYLENE

James H. Flynn, Denham Springs, and Donald E. McLemore, Baton Rouge, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 18, 1982, Ser. No. 339,914

Int. Cl.³ G01N *3/48*

U.S. Cl. 73—81 **10 Claims**



1. A method for measuring the tendency to and degree which a synthetic resinous particulate solid will agglomerate, comprising the steps of:

(a) forming a cake of a synthetic resinous particulate solid by compressing the particulate solid between substantially parallel surfaces; and

(b) measuring the force required to break the cake by an elongated triangular-shaped wedge which is forced into the cake at a constant rate of speed.

4,412,449
APPARATUS FOR MEASURING THE FLOW VELOCITIES OF GASES AND LIQUIDS

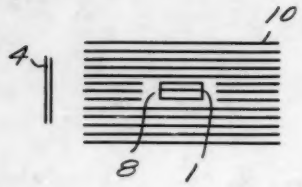
Kurt Eiermann, Pfungstadt, and Wolfgang Schafer, Frankfurt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 10, 1981, Ser. No. 242,405

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009382

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **4 Claims**



1. In an apparatus for measuring the flow velocity of gases and liquids, especially the intake air of combustion engines, having at least one temperature dependent resistance and where at least one of the resistances is heated, wherein the heated resistance is disposed downstream from a protective shield means, the improvement comprising, positioned between the protective shield means and the heated resistance, means for producing a laminar flow, and means for producing laminar flow positioned behind the heated resistance, said means for producing a laminar flow before and after the heated resistance comprising connecting honeycombs having a hollow space therein and wherein said resistance is positioned in said hollow space.

4,412,450
ARRANGEMENT FOR DETERMINING THE LEVEL IN A CONTAINER

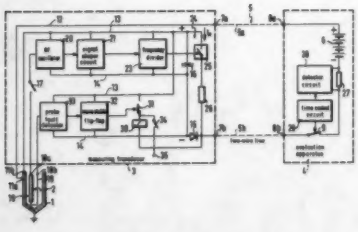
Hans-Jurgen Franz, Schopfheim, and Volker Dreyer, Lorrach-Haagen, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Maulburg, Fed. Rep. of Germany

Filed Jul. 22, 1981, Ser. No. 285,763

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029279; Jul. 13, 1981, 3127637

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C **13 Claims**



1. An arrangement for determining the level of material in a container, comprising:

a capacitive probe disposed in said container and defining a probe capacitance between said probe and said container dependent upon the material level in the container;

transducer means including a capacitance responsive circuit, disposed in the vicinity of said container, for producing a signal dependent on the capacitance existing at the input of said capacitance responsive circuit;

evaluation means disposed remote from said container;

a two-wire line connecting said evaluation means with said transducer means, said line comprising a means for transmitting a current supply DC voltage for operating said transducer means from said evaluation means to said transducer means, and for transmitting said signal from said transducer means to said evaluation means;

switching means, disposed in said transducer means, for switching, upon actuation, the input of said capacitance responsive circuit from said probe capacitance to said test capacitance;

time-controlled means, provided in said evaluation means, for changing the current supply DC voltage on said two-wire line periodically in a pulse-like manner;

a control circuit, disposed in said transducer means, responsive to said pulse-like changes of the current supply DC voltage, for actuation of said switching means;

whereby in each period of said pulse-like changes in current supply DC voltage said signal produced by said transducer means is a measured value signal which corresponds to said probe capacitance during a measuring time interval when said switching means is not actuated, and a test signal which corresponds to said test capacitance upon actuation of said switching means during a test time interval.

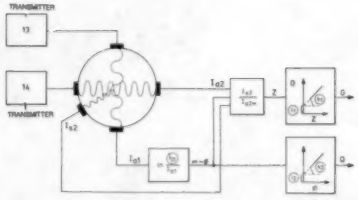
4,412,451
METHOD AND APPARATUS FOR THE DETERMINATION OF THE AVERAGE PARTICLE SIZE IN A SLURRY

Seppo J. Uusitalo; Georg C. von Alfthan, both of Espoo; Tor S. Andersson, Luoma; Väinö A. Paukku, Espoo; Lasse S. Kähärä, Espoo, and Erkki S. Kiuru, Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation of Ser. No. 151,778, May 21, 1980, abandoned. This application Jul. 16, 1982, Ser. No. 399,002

Int. Cl.³ G01N *29/00, 15/00, 7/00*

U.S. Cl. 73—432 PS **7 Claims**



1. A method for the determination of the average particle size in a slurry, which comprises

transmitting at least one beam of ultrasonic rays, having a certain frequency, into the slurry,

detecting ultrasonic radiation which has passed through the slurry,

creating a first signal corresponding to the intensity Ia of the detected radiation,

detecting in a selected direction ultrasonic radiation scattered in the slurry,

creating a second signal corresponding to the intensity Is of the detected scattered radiation,

determining the scattering attenuation factor on the basis of the first and second signals thus obtained,

determining the total attenuation factor with the aid of the intensity Io of passed-through ultrasonic radiation obtained in pure water, and

determining a measure descriptive of the average particle size with the aid of the scattering attenuation factor, whereby the ratio of the scattering attenuation factor and

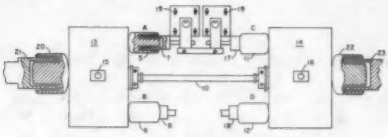
the total attenuation factor is formed in order to eliminate the influence of slurry density.

4,412,452

HARMONIC OSCILLATOR FOR MEASURING DYNAMIC ELASTIC CONSTANTS OF ROCK MATERIALS

Maurice A. Biot, Brussels, Belgium; William L. Medlin, and Lucien Masse', both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,716
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—579 8 Claims



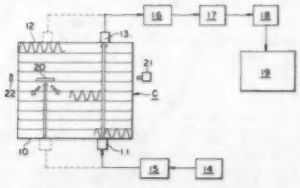
1. A harmonic oscillator for measuring dynamic elastic constants of rock materials at seismic frequency, comprising:
(a) a pair of masses,
(b) means for independently and vertically suspending each of said masses from a support position such that said masses can swing or vibrate in pendulum-like fashion,
(c) a permanent magnet mounted on one of said masses,
(d) a coil positioned in the air gap of said magnet,
(e) means for connecting a sinusoidal seismic frequency to said coil for applying a driving force through said magnet to said mass,
(f) means for horizontally supporting a rock material between said masses, the weight of said masses being large relative to the weight of said rock material to permit said rock material to vibrate at seismic frequencies, thereby forming a simple harmonic oscillator with said rock material acting as the spring element connecting said masses as they vibrate in pendulum-like fashion, and
(g) means for measuring the relative displacements of said masses said relative displacements being a measure of the dynamic elastic constant of said rock material.

4,412,453

METHOD FOR DETECTING BRAZING DEFECTS IN PLATE-FIN TYPE HEAT EXCHANGERS

Nobuyuki Nagai, Kobe; Eiji Takahashi, Akashi; Yoji Matsumoto, Akashi, and Hideaki Ohtsu, Akashi, all of Japan, assignors to Kabushiki Kaisha Kobe Sekio Sho, Kobe, Japan

Filed Oct. 15, 1981, Ser. No. 311,599
Claims priority, application Japan, Oct. 16, 1980, 55-145528
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—601 8 Claims



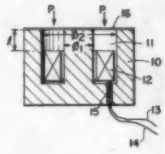
1. A method for detecting brazing defects in a plate-fin type heat exchanger utilizing a pulser and a sensor and including a brazed core structure having a number of wavy-like fin members positioned alternately with a number of parallelly spaced plate members, with comprises:
directing a pulsed sound across said fin and said plate members in a frequency range of from several tens KHz to several hundreds KHz from said pulser located on one outermost plate member to said sensor located opposingly on the other outermost plate member; and
two-dimensionally detecting the position and size of a brazing defect on a plane of a plate on the basis of the level of the sound received by said sensor.

4,412,454

PRESSURE SENSING UNIT FOR A PRESSURE SENSOR

Ichiro Yamashita, Yawata, and Yukihiko Ise, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 17, 1981, Ser. No. 284,568
Claims priority, application Japan, Jul. 17, 1980, 55-98378
Int. Cl.³ G01L *9/16*
U.S. Cl. 73—728 10 Claims



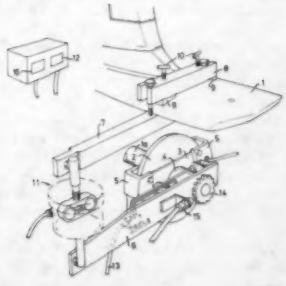
1. A pressure sensor unit comprising:
a casing having at least in part thereof of a magnetic body and said casing forming an interior space isolated from the space around said sensor unit, said magnetic body having at least in a part thereof an amorphous magnetic alloy thin plate in a magnetic circuit with said magnetic body and which plate has a magnetostriction property and which is exposed to said inner space and the space around said sensor unit on opposite sides thereof; and
a coil in magnetic relationship with said magnetic circuit for exciting said magnetic circuit.

4,412,455

METHOD AND APPARATUS FOR MEASURING THE TORQUE OR POWER OF A BOAT MOTOR IN PLACE

Kjell I. Borgersen, Hjälteby, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Oct. 6, 1981, Ser. No. 309,115
Claims priority, application Sweden, Oct. 6, 1980, 8006973
Int. Cl.³ G01L *3/16*
U.S. Cl. 73—862.12 5 Claims



1. A process for measuring at least the torque of a motor installation in a boat having a propeller carried by a propeller shaft, comprising removing the propeller from the propeller shaft, mounting on the propeller shaft a brake disc and a sup-

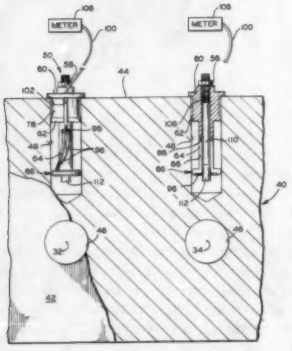
porting element which is rotatable relative to the brake disc about the axis of the brake disc and that carries braking means and has force actuated means for applying the braking means to the brake disc, mounting a force measuring instrument between, on the one hand, a member fixed relative to the boat, and, on the other hand, said supporting element with said force measuring instrument spaced from the axis of rotation of the supporting element, test driving the motor with the boat lying in the water and the brake disc immersed in and in contact with the water, thereby using the water as a cooling agent for cooling the brake disc, and observing measurements of said force measuring instrument.

4,412,456

LOAD SENSING PROBE

Donald F. Wilhelm, Maumee, and Robert L. Moser, Toledo, both of Ohio, assignors to Helm Instrument Company, Inc., Toledo, Ohio

Filed Feb. 16, 1982, Ser. No. 348,992
Int. Cl.³ G01L *1/22, 5/00*
U.S. Cl. 73—862.65 **17 Claims**



1. In a machine tool having a back-up member arranged to support a tool at a working station during a working period by sustaining work forces and subject to strain from the work forces applied to the tool, the back-up member having a cavity formed therein, a load sensing probe confined in said cavity for measuring the work forces applied to the back-up member comprising:

a generally cylindrical member adapted for insertion in the cavity including an elongate stem and sensing portions disposed at one end of said stem, said member having a slot formed between said sensing portions and a part of said stem to define a pair of sensing arms;

strain gauge means attached to each of said sensing portions of said sensing arms for measuring the amount of force applied thereto; and

preloading means for flexibly moving said sensing arms outwardly such that said sensing portions engage an inside wall of the cavity at a predetermined initial level of compression, whereby when work forces applied to the back-up member cause relative closing movement of the cavity, said closing movement can be measured as a change from the amount of preload compression applied to said sensing portions.

16. A method of measuring the work forces applied to a back-up member in a machine tool, the back-up member being arranged to support a tool at a working station during a working period by sustaining work forces, comprising the steps of:

a. forming an elongate cavity in the back-up member, the cavity extending laterally from a point adjacent the working station to a face of the back-up member;

b. inserting a generally cylindrical member into the cavity, said cylindrical member including an elongate stem, sensing portions disposed at one end of the stem, a slot formed between the sensing portions and a part of the stem defining a pair of sensing arms, and strain gauge means attached to each of the sensing portions of the sensing arms for measuring the amount of force applied thereto;

c. flexibly moving the sensing arms outwardly such that the sensing portions engage an inside wall of the cavity at a predetermined initial level of compression; and

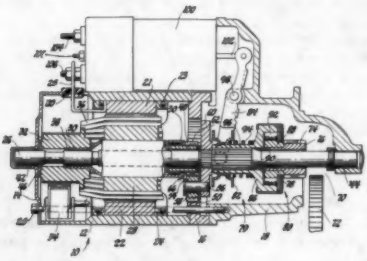
d. measuring the work forces applied to the back-up member as relative closing movement of the cavity caused by work forces applied to the back-up member, which movement can be measured as a change in the amount of the predetermined initial level of compression applied to the sensing portions.

4,412,457

IN-LINE ENGINE CRANKING MOTOR DRIVE HAVING REDUCTION GEAR SET

Jack A. Colvin, and John M. McClellan, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1981, Ser. No. 258,685
Int. Cl.³ F02N *15/06*
U.S. Cl. 74—7 A **3 Claims**



1. An electric cranking motor drive for an internal combustion engine comprising: a housing, a central shaft rotatably supported at both ends by said housing, an electric motor having an armature carried on a hollow armature shaft, said armature shaft being disposed about a portion of said central shaft and rotatably supported thereon, means defining a gear set connected between said armature shaft and said central shaft for establishing a power path through which said armature shaft may drive said central shaft, and a pinion gear shiftably coupled to said central shaft so as to be driven thereby, said pinion gear being adapted to be shifted into engagement with the flywheel gear of said engine for cranking.

4,412,458

VEHICLE PARKING BRAKE ACTUATING MECHANISM

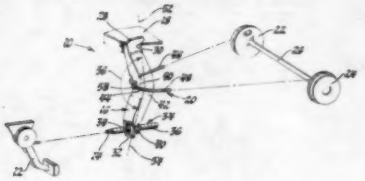
John G. Derringer, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1981, Ser. No. 234,026
Int. Cl.³ F16C *1/10;* **G05G** *1/10*
U.S. Cl. 74—512 **2 Claims**

1. In a vehicle parking brake actuating mechanism for mechanically actuating a set of laterally oppositely disposed vehicle wheel brakes by a parking brake lever moved by the vehicle operator to apply tension on an apply cable which in turn moves an equalizer bar to equally tension a brake actuating cable having segments leading to each wheel brake of said brake set, the improvement comprising:

said equalizer bar having one end pivotally attached to a fixed vehicle portion for substantially planar pivotal movement about said one end, and having another end provided with an adjustable effective length link attached thereto and secured to the apply cable, said equalizer bar

being pivoted about said one end in a brake applying direction when said apply cable is moved by tension force from said parking brake lever, and having a center section receiving a loop of a brake actuating cable thereabout, said brake actuating cable segments extending from said loop to said wheel brakes and being tensioned and moved when said apply cable is tensioned and moved, the portion of said center section engaging said brake actuating cable



loop being angularly displaced toward said wheel brakes relative to said equalizer bar ends such that lines from said bar ends to said cable-engaging center portion intersect at said cable-engaging center portion at an angle other than 180° in the plane of pivotal movement of said equalizer bar, and means retaining said brake actuating cable loop in position on said cable-engaging center section portion of said equalizer bar.

4,412,459

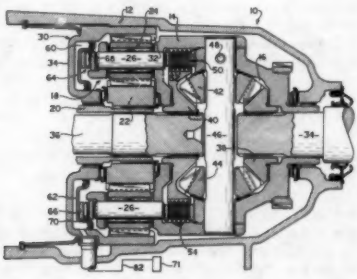
CONTROLLED DIFFERENTIAL

Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 15, 1981, Ser. No. 254,355

Int. Cl.³ F16H *1/44*

U.S. Cl. 74—711 **30 Claims**



1. A differential assembly comprising a casing, a carrier, a planetary gear set supported by said carrier, an input for driving said planetary gear set to effect rotation of said carrier, pinion means supported by said carrier for rotation therewith, a pair of side gears meshing with said pinion means, a first output driven by one of said side gears, a second output driven by the other of said side gears, and clutch means having an actuated condition for retarding the relative rotation of one of said side gears and said carrier and an unactuated condition, said planetary gear set including means movable to move said clutch means toward said actuated condition to retard relative rotation of one of said side gears and said carrier upon the occurrence of a predetermined condition.

4,412,460

TWO-SPEED COUPLINGS

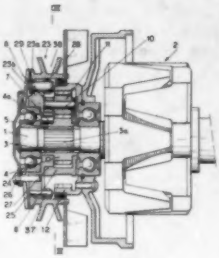
Andre J. Barthelemy, St. Remy-les-Chevreuse, France, assignor to S.A. Automobiles Citroen and Societe dite Automobiles Peugeot, both of Paris, France

Filed Sep. 15, 1980, Ser. No. 187,162

Claims priority, application France, Jun. 23, 1980, 80 14282

Int. Cl.³ F16H *3/74, 5/46;* F16D *43/16*

U.S. Cl. 74—752 E **5 Claims**



1. A driving device for motor vehicle accessories comprising:

a driving member;

a driven member;

a crown gear fixed against rotation;

a sun gear fixed on the driven member;

a planet gear holder capable of rotation relative to the driving member and the sun gear;

at least two planet gears rotatably mounted on said holder and meshing with both said crown gear and said sun gear;

a unidirectional coupling between the driving and driven members; and

a centrifugal clutch between said driving member and said holder, said centrifugal clutch comprising a plurality of spaced-apart pivoting members pivotally secured to said driving member and having free ends engageable with a contact surface of said holder, and respective springs acting upon said pivoting members and urging same into engagement with said contact surface, whereby at rotational speeds of the driving member below a predetermined rotational speed determined by the centrifugal clutch, said pivoting members engage said holder to transmit drive from the driving member to the driven member through said planet gears and said sun gear to rotate the driven member by higher speed than the driving member and at a rotational speed of the driving member above said predetermined rotational speed, said pivoting members are disengaged from said holder to permit direct transmission of drive from said driving member to the driven member through the unidirectional couplings.

4,412,461

ROTARY TRANSMISSION ELECTRONIC CONTROL SYSTEM PROVIDING AUTOMATIC CHANGES OF SPEED RATIO

Harry M. Windsor, Harbury, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Feb. 24, 1981, Ser. No. 237,691

Claims priority, application United Kingdom, Feb. 28, 1980, 8006846

Int. Cl.³ B60K *41/28*

U.S. Cl. 74—866 **4 Claims**

1. A control system for a rotary power transmission having:

a common input shaft;

a common output shaft;

a set of gear trains between said input and output shafts and providing a series of increasing speed ratios;

a first clutch engagable to establish driving connection be-

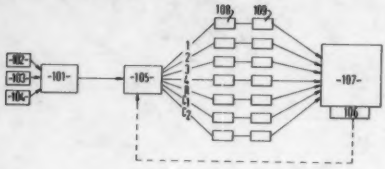
tween said input and output shafts, through at least one of said gear trains;

a second clutch engagable to establish driving connection between said input and output shafts, through one other of said gear trains;

the gear trains of alternate speed ratios in the set being arranged for drive to be established respectively through said first clutch and said second clutch;

said control system comprising:

sensor means for each of said clutches and each of said speed ratios for sensing and producing a feedback signal indicating a state of engagement;



command means responsive to transmission operating parameter signals to produce a command signal indicating a required speed ratio;

control means arranged to combine said feedback signals and said command signal to produce control signals to control clutch and speed ratio engagement and disengagement through an array of electronic logic elements in a given sequence of discrete steps, each discrete step being initiated by a change in state of a feedback signal; and

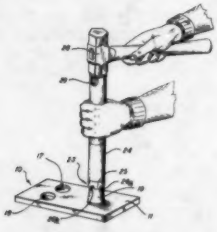
operating means arranged to engage and disengage each clutch and each speed ratio in response to said control signals.

4,412,462

DRILL ADJUSTING TOOL

Hubert P. McGavin, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,296
Int. Cl.³ B21K *5/06*
U.S. Cl. 76—5 R **5 Claims**



1. A core drill adjusting tool, comprising:

a base plate of a predetermined size and thickness and formed of a preselected material,

test means on said base plate to provide an indication of the correct diameter of said core drill, and

cone means supported by said base plate at its larger end to project therefrom,

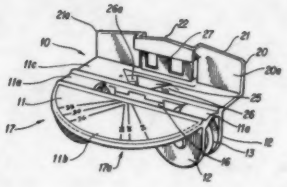
so that a core drill, that has become too small in diameter through use, will have its cutting surfaces spread an amount indicated by said test means as correct by applying said cutting surfaces forcefully over said cone means.

4,412,463

CHAIN SAW SHARPENING GUIDE

Cornelis J. M. Beerens, 40-42 Berkshire Rd., NSunshine, Vic., Australia

PCT No. PCT/AU80/00093, § 371 Date Jul. 14, 1981, § 102(e) Date Jul. 14, 1981, PCT Pub. No. WO81/01379, PCT Pub. Date May 28, 1981
PCT Filed Nov. 20, 1980, Ser. No. 285,080
Claims priority, application Australia, Nov. 23, 1979, PE1462
Int. Cl.³ B23D *63/10*
U.S. Cl. 76—36 **7 Claims**



1. A saw sharpening guide comprising:

a support member adapted to be positioned on a saw blade in a straddling relation thereto with a portion thereof resting on the tips of the teeth of the saw blade;

a pair of rollers each having a continuous peripheral groove and mounted on the support member for rotation on their respective axes in a common plane;

said rollers being arranged so that, when the support member is in its straddling relation, the pair of rollers are located on opposite sides of the saw blade and a file seated in the continuous peripheral grooves of both of the pair of rollers can reciprocate in a line in said common plane and transverse to the saw blade while in rolling contact with the pair of rollers;

a pair of sight lines on the support member oriented at an incline at equal and opposite angles to said common plane and located to be viewed by an operator when the support member is in its straddling relation;

said support member being positionable and manually retainable on the saw blade in its straddling position with either of the pair of sight lines parallel to the saw blade;

said incline of the pair of sight lines being the complement of the cutting angle of the teeth of the saw blade to be sharpened;

said portion of the support member which rests on the tips of the teeth of the saw blade being spaced from the axes of the pair of rollers a distance selected to position the file seated in the continuous peripheral grooves at a predetermined height relative to the teeth of the saw blade to be sharpened;

wherein the support member has an edge located to be positioned adjacent to and substantially parallel to the length of a tooth to be sharpened when the guide is in use on the saw blade, and further wherein the support member has linear graduations along said edge.

4,412,464

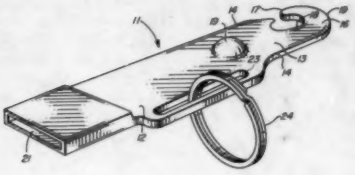
COMBINATION CAN OPENING TOOL

Jeffrey J. Cook, 6533 N. Seventh Ave., Apt. 3, Phoenix, Ariz. 85013

Filed Sep. 1, 1982, Ser. No. 413,970
Int. Cl.³ B67B *7/44*
U.S. Cl. 81—3.1 R **5 Claims**

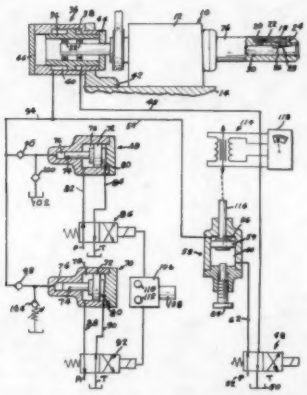
4. The combination of a key ring and a tool for opening scored closures for cans, said tool comprising an elongated body having means at one end thereof for pulling away closures and means at the other end thereof for opening displaceable closures which remain attached to the can and means providing an elongated slot in said body and running length-

wise thereof for receiving said key ring, the arrangement being such that said ring can be moved in said slot along the body of



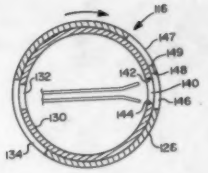
the tool away from the end of the body having the opening means selected for use.

4,412,465
TOOL COMPENSATOR
Lawrence B. Wright, Berkley, Mich., assignor to Lamb Technicon Corp., Warren, Mich.
Filed Dec. 7, 1981, Ser. No. 328,205
Int. Cl.³ B23B *49/00, 47/18*
U.S. Cl. 82—1.2 **14 Claims**



1. In a machine tool, a tool compensating device for reciprocating a cutting tool when the dimension of a machined workpiece deviates from a predetermined desired dimension comprising a tool positioning cylinder having a piston axially displaceable therein and dividing the cylinder into a control chamber and a pressure chamber which vary inversely in size in response to axial displacement of the piston, means operatively connecting the cutting tool and the piston such that the tool moves to increase and decrease its depth of cut in response to displacement of the piston in opposite directions, means for optionally connecting said pressure chamber to a source of pressurized hydraulic fluid for displacing the piston in a direction to decrease the size of the control chamber, a variable volume reservoir having a predetermined maximum volume, a conduit connecting the control chamber with said variable volume reservoir to form a closed fluid circuit so that the volume of hydraulic fluid in the control chamber, the conduit and the reservoir remains constant except when varied by the hereinafter mentioned metering means, the arrangement being such that when the pressure chamber is pressurized the piston is displaced to decrease the size of the control chamber and hydraulic fluid is displaced therefrom, through said conduit and into said reservoir until the reservoir increases in size to its maximum volume and metering means for optionally injecting or extracting predetermined volume increments of hydraulic fluid to and from said closed fluid circuit whereby to vary the extent to which said piston is displaced when said pressure chamber is pressurized.

4,412,466
TUBULAR KNIFE
Walter J. Jurkowski, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Division of Ser. No. 92,617, Nov. 8, 1979, abandoned. This application Aug. 19, 1981, Ser. No. 295,195
Int. Cl.³ B26D *1/38*
U.S. Cl. 83—200 **3 Claims**

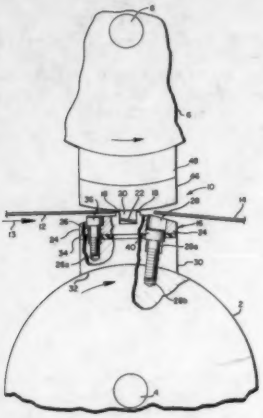


1. A tubular knife for cutting sheet material, comprising:
a stationary, inner cylindrical member having a forward slot extending substantially longitudinally thereof, said slot having a longitudinally extending upper cutting edge and a longitudinally extending lower cutting edge;
a rotatable, outer tube concentric and substantially contiguous with said inner member, said outer tube having a first forward slot and a second forward slot above said first forward slot, said first forward slot having a upper cutting edge inclined at a slight angle with respect to the lower cutting edge of the inner member, and said second forward slot having a lower cutting edge inclined at a slight angle with respect to the upper cutting edge of the inner member, each of said first and second forward slots being substantially co-extensive with said forward slot of said inner member; and
means for rotating the upper cutting edge of the first forward slot past the lower cutting edge of the forward slot of the inner cylindrical member to a first home position and for rotating the lower cutting edge of the second forward slot past the upper cutting edge of the forward slot of the inner cylindrical member to a second home position.

4,412,467
CYLINDER-MOUNTED CUTTER
Ronald F. DeSanto, Palos Hills, Ill., assignor to Lehigh Steck Warlick, Broadview, Ill.
Filed Sep. 14, 1981, Ser. No. 301,947
Int. Cl.³ B26D *1/62*
U.S. Cl. 83—346 **3 Claims**

1. In a printing press, a cut-off mechanism for cutting a traveling web into a number of pieces sebsequent to printing on the web, said mechanism comprising a die cylinder assembly and a cooperating anvil cylinder assembly, the two assemblies being rotatable about parallel axes in timed relation to the travel of the web therebetween, said anvil cylinder assembly having an anvil on its periphery, said die cylinder assembly comprising a die cylinder, a base member mounted on the periphery of said die cylinder, a first group of fasteners projecting through the base member and threaded into the die cylinder for securing the base member to the die cylinder, a cutting die carried by said base member radially outwardly thereof and having at least one radially outwardly presented cutting edge for engagement with said anvil to cut the web repeatedly, a resilient sheet of elastomeric material interposed between said die and said base and yielding within its elastic limits as said cutting edge engages said anvil to take up relative radial dis-

placement between the cutter die on the one hand and said anvil and base member on the other hand during the cutting operation, and a second group of fasteners, separate and distinct from said first group, projecting through said die and



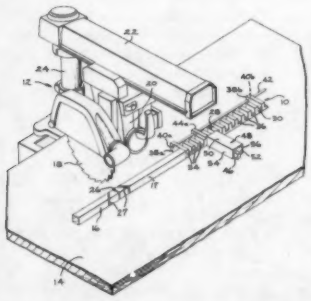
resilient sheet and threaded into said base member to secure the die to the base member entirely by the applied torque of said second group of fasteners, said second group of fasteners causing said die to impose compressive pressure on said sheet.

4,412,468

TABLE MOUNTED STOP GAUGE FOR A CUTOFF SAW

James D. Bucy, 625 S. Fourth St., Murray, Ky. 42071

Filed Jul. 6, 1981, Ser. No. 280,694
Int. Cl.³ B27B *27/08*
U.S. Cl. 83—468 **7 Claims**



1. A saw gauge for use with a cutoff saw of the type which includes a cutting table, an elongated fence mounted on said table, and a cutting blade adapted to cut through said fence and a board positioned on said table against said fence, said saw gauge comprising

a plurality of bar segments, each of said segments being defined by a base portion adapted to mount flush upon said table in line with said fence and a plurality of raised ribs projecting upwardly from said base portion and being spaced from one another to form a plurality of open ended, U-shaped channels spaced above said table by the width of said base portion, the forward ends of said channels and ribs terminating in line with the front face of said fence, z

an elongated pivot pin extending parallel to said bar segments behind and spaced from said ribs,

means attached to said bar segments for supporting said pin,

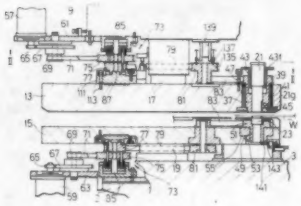
at least one straight, elongated stop arm pivotally connected on one end portion thereof directly to said pin and being tiltable through a vertical arc from a storage position projecting away from one of said channels with which said arc is aligned to a position of use projecting through one of said channels with which said arc is aligned and beyond the front face of said ribs, said arm being slidable along said pin for selectively aligning said arc with any one of said channels.

4,412,469

TURRET PUNCH PRESSES HAVING TOOL HOLDERS ROTATABLY MOUNTED IN THE TURRETS

Tadashi Hirata, Yamato, and Katsuyoshi Sakamoto, Isehara, both of Japan, assignors to Amada Company, Ltd., Japan

Filed Mar. 18, 1981, Ser. No. 244,900
Claims priority, application Japan, Mar. 18, 1980, 55/033330
Int. Cl.³ B26F *1/14*
U.S. Cl. 83—552 **4 Claims**



1. A turret punch press having motor-driven rotatable upper and lower turrets for punching holes in sheet materials, comprising:

a plurality of upper punching tools rotatably attached to said upper turret;

a plurality of lower punching tools rotatably attached to said lower turret;

a vertically movable ram attached to said punch press in such a manner that, upon activation, it drives at least one of said plurality of upper and at least one of said plurality of lower punching tools through said sheet material;

means for synchronously rotating said upper and lower punching tools to desired positions; and

said means for synchronously rotating said upper and lower punching tools including servomotors connected to drive said rotatable plurality of upper and lower punching tools, whereby holes of the same shape but with different orientations may be punched in said sheet material.

4,412,470

SYSTEM FOR COMMUNICATING DATA AMONG MICROCOMPUTERS IN AN ELECTRONIC MUSICAL INSTRUMENT

Edward M. Jones, Cincinnati, Ohio, assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio

Filed Jun. 8, 1981, Ser. No. 271,133
Int. Cl.³ G10H *7/00*
U.S. Cl. 84—1.01 **14 Claims**

1. In an electronic musical instrument having microprocessors for controlling the sounding of music, apparatus for communicating data among the microprocessors, said apparatus comprising:

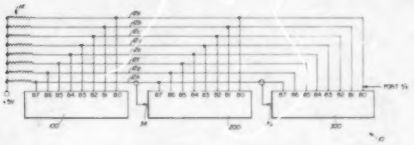
synchronizing signal means for generating a synchronizing signal having a pulse of a predetermined width;

a plurality of microprocessors having external interrupt terminals for receiving said synchronizing signal and

causing an interrupt of the microprocessors to occur in response to the receipt of a synchronizing signal, said microprocessors also having data communications ports for receiving and transmitting data and for receiving said synchronizing signal;

communications bus means for interconnecting said communication ports of said microprocessors; and

sampling means responsive to the receipt of a synchronizing



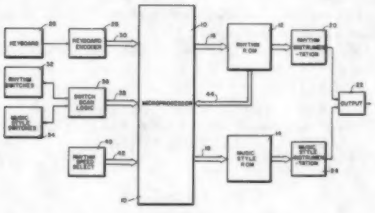
signal on said external interrupt terminals for sampling the synchronizing signal received on said communication ports via said communication bus means and determining whether said pulse has ended and, depending upon whether said pulse is still occurring when the sampling is made, introducing a predetermined amount of delay so that the inputting of data by said microprocessors occurs synchronously with the transmission of such data by one of said microprocessors.

4,412,471

SYNCHRONIZATION SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT HAVING PLURAL AUTOMATIC PLAY FEATURES

Glenn R. Stier, Vernon Hills, and Moshe Mizrachi, Des Plaines, both of Ill., assignors to Norlin Industries, Inc., White Plains, N.Y.

Filed Jun. 22, 1982, Ser. No. 391,018
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **11 Claims**



1. An electronic musical instrument comprising:

means continuously developing a clock signal defining a sequence of clock intervals;

a first memory addressable for repetatively implementing a first musical pattern of N-bars of a first automatic play feature in accordance with a plurality of first instructions stored at a plurality of consecutive memory locations thereof, each of said first instructions including an associated timing code representing a number of said clock intervals until the next memory location of said first memory is to be addressed;

a second memory addressable for implementing a second musical pattern of N-bars of a second automatic-play feature in accordance with a plurality of second instructions stored at a plurality of memory locations thereof; and

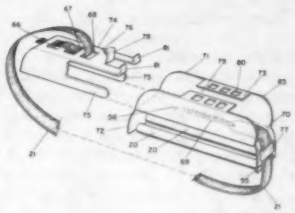
means operable in response to said clock signal and said timing codes for addressing said first memory and in response to said clock signal for addressing said second memory such that said first and second N-bar musical patterns are completed in time coincidence regardless of the times of initiation of operation of said first and second automatic play features.

4,412,472

MUSICAL INSTRUMENT CAPOTASTO

William G. Welch, 417 Dorothy NE., Albuquerque, N. Mex. 87123

Continuation-in-part of Ser. No. 894,696, Apr. 10, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 70,541
Int. Cl.³ G10D *3/04*
U.S. Cl. 84—318 **6 Claims**



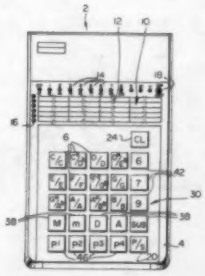
1. A capotasto, for use in connection with a string instrument with a neck including a finger board and strings therealong, said capotasto comprising a body having mounted therein two or more rigid but flexible roller pins each pin having rotatably mounted thereon rollers; said rollers being generally cylindrical in shape and said rollers having a hard inner core and a soft resilient outer core; and said capotasto having a traction strap and means for attaching and tensioning the traction strap around the neck of the string instrument so that the rollers of the capotasto bear on the strings of the instrument.

4,412,473

CALCULATOR FOR GUITAR CHORDS

Daniel C. Laflamme, Vancouver, Canada, assignor to D C L Microelectronics, Inc., Vancouver, Canada

Filed Apr. 7, 1981, Ser. No. 251,950
Int. Cl.³ G09B *15/00*
U.S. Cl. 84—485 R **8 Claims**



1. An electronic device in the nature of a hand held calculator, for illustrating on a display area the required string and fret positions of a fretted stringed instrument to be fingered to play the notes making up a particular chord, comprising:

(a) a series of manually operable basic chord information buttons, each associated with a corresponding chord information switch, one chord information switch for each chord for which finger position information is desired;

(b) a visual representation of the strings of the fretted instrument and of the frets over a particular range;

(c) electronically actuated fret and string finger position

indicator means associated with the fret and string representation, each of the string finger positions for each of the frets having electronically actuable indicator means associated with it;

(d) electronically actuated open string position indicator means associated with each string of the fret and string representation to indicate when a corresponding string is not fingered;

(e) electronically actuated first fret reference indicator means to represent a fret reference point for a selected chord;

(f) manually operable select means associated with select switch means;

(g) ROM means programmed with chord table information relating chords to desired keys with related fret and string finger position information;

(h) microprocessor means electronically associated with the chord information switches, open string position indicator means, first fret reference indicator means, fret and string finger position indicator means and select switch means, the microprocessor adapted to store information concerning the particular chord information switch or switches actuated until the select switch means is actuated, and then search the ROM for fret and finger position information corresponding to the chord information switch or switches actuated, and display that information on the appropriate fret and string finger position indicator means, open string position means and first fret reference indicator means;

(i) manually operable switch means electronically associated with the microprocessor and fret and string finger position indicator means to clear information displayed on the fret and string representation as required; whereby the device provides an accurate visible indication on the fret and string representation, of the strings and fret positions to be fingered for a selected predetermined chord.

4,412,474

FIBER CORDAGE

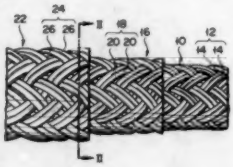
Hiromasa Hara, Toyokawa, Japan, assignor to Tokyo Rope Manufacturing Co., Ltd., Japan

Filed Aug. 21, 1981, Ser. No. 295,068

Claims priority, application Japan, Aug. 29, 1980, 55-122931[U]

Int. Cl.³ D04C 1/12

U.S. Cl. 87—6 **8 Claims**



1. A fiber cord comprising:

a core element which is formed by braiding a plurality of strands, each comprising at least one organic fiber of high elongation;

an outer layer element which surrounds said core element and which is formed by braiding a plurality of strands, each comprising at least one organic fiber of low elongation; and

a protective layer which surrounds said outer layer element and which is formed by braiding a plurality of strands, each comprising at least one organic fiber of high elongation.

4,412,475

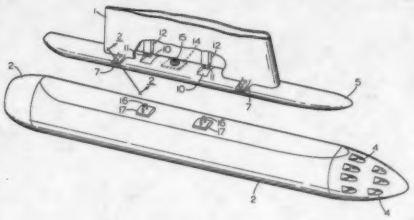
AIRCRAFT ROCKET AND MISSILE LAUNCHER

Thomas W. Hornby, Mesa, Ariz., assignor to Northrop Corporation, Hawthorne, Calif.

Filed May 27, 1980, Ser. No. 153,314

Int. Cl.³ F41F 3/06

U.S. Cl. 89—1.816 **9 Claims**



1. Missile launcher apparatus for carrying missiles on an aircraft having a pylon member and release hook means mounted in said pylon member, the apparatus comprising:

a hardback portion fixable adjustably to said pylon member and having spaced lug receiving openings therethrough;

a jettisonable missile launcher portion for holding and firing a plurality of missiles therefrom, having support lug means arranged in spaced relation on the upper side thereof, and an upper surface configuration for receiving said hardback portion, said launcher portion having an installed position abutting the lower side of said hardback portion with said lugs of said launcher portion positioned through said lug receiving openings in said hardback portion for engagement with said hook means of said aircraft, and release therefrom.

4,412,476

TANDEM MACHINE WITH OPPOSED FREE PISTONS

Henry Benaroya, 41, Bld du Commandant Charcot, Neuilly-sur-Seine 92200, France

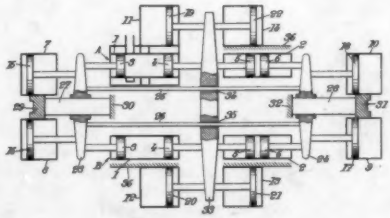
PCT No. PCT/FR80/00070, § 371 Date Jan. 7, 1981, § 102(e) Date Dec. 31, 1980, PCT Pub. No. WO80/02442, PCT Pub. Date Nov. 13, 1980

PCT Filed May 6, 1980, Ser. No. 229,561

Claims priority, application France, May 7, 1979, 79 11513

Int. Cl.³ F01B 7/02, 1/00

U.S. Cl. 92—75 **10 Claims**



1. A tandem free piston machine comprising:

at least two groups of motor cylinders located parallel to a common axis, each said group including two aligned motor cylinders arranged on opposite sides of a transversal midplane of the machine and each cylinder reciprocably locating an outer drive piston and an inner drive piston arranged for movements in opposite directions,

two pluralities of compressor pistons each reciprocably located in a compressor cylinder,

first connecting means including a pair of outer cross mem-

bers and mechanical cross member linking means, said first connecting means rigidly interconnecting said outer drive pistons and a first one of said pluralities of compressor pistons to constitute an outer reciprocating train,

second connecting means including an inner cross member and rigidly interconnecting said inner drive pistons and a second one of said pluralities of compressor pistons to constitute an inner reciprocating train,

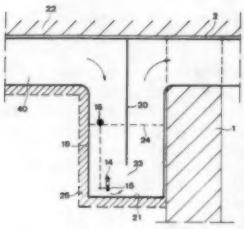
wherein said compressor pistons of said outer train are located outside of said outer cross members in the axial direction while all said drive pistons, said linking means of said outer train and said inner cross-member are located between said outer cross members in the axial direction.

4,412,477

ARRANGEMENT TO COUNTERACT OR PREVENT SPREADING OF FIRE OR SMOKE

Knut Bergdahl, Kvartsgrand 4, S-852 52 Sundsvall, Sweden

Continuation of Ser. No. 35,824, May 4, 1979, Pat. No. 4,294,165. This application Jul. 10, 1981, Ser. No. 282,026
Claims priority, application Sweden, May 8, 1978, 7805197
Int. Cl.³ F16K *9/00*
U.S. Cl. 98—1 **4 Claims**



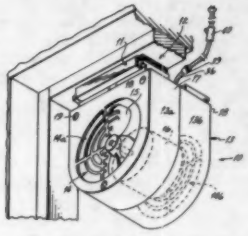
1. An arrangement to counteract or prevent the spreading of fire or smoke comprising means for defining a partition between two chambers of a static structure, means for defining an aperture in said partition for normally placing said two chambers in fluid communication with each other, means for normally maintaining said aperture open while being operative to close said aperture in response to the detection of fire or smoke, said last-mentioned means including a drain trap-like conduit portion through which air can normally flow to pass through said aperture between said two chambers, means for detecting a predetermined level of smoke or temperature, means for responding to said detecting means for filling and closing said drain trap-like conduit portion with a non-combustible fluid thereby closing communication between said two chambers through said aperture, said drain trap-like conduit portion being located substantially entirely in one of said two chambers, said partition being a vertical wall common to said two chambers and said aperture being contiguous ceilings of said two chambers, said drain trap-like conduit portion being defined by a bight conduit portion and a pair of upwardly opening conduit leg portions all located in one of said chambers, and a conduit connecting one of said upwardly opening conduit leg portions to the other of said chambers through said aperture, and said one upwardly opening conduit leg portion being located adjacent said vertical wall.

4,412,478

AIR DISTRIBUTION METHOD AND APPARATUS FOR EFFECTING THE SAME

John D. Osher, 8366 Gwilada Dr., Cincinnati, Ohio 45236, and Tom Rattray, 233 Fleming Rd., Cincinnati, Ohio 45215

Filed Nov. 19, 1981, Ser. No. 322,780
Int. Cl.³ F24F *7/00*
U.S. Cl. 98—33 R **6 Claims**



1. An apparatus for distributing air between rooms separated by a doorway, comprising

an electric fan having a motor, a blade mounted on the motor shaft and a casing surrounding said motor blade and shaft, said casing having a substantial dimension in the direction of the axis of said shaft,

a single elongated mounting element secured in said doorway and extending generally parallel to the plane of said doorway, said element being spaced off-center away from said door,

a pair of spaced parallel elongated mounting elements secured to the upper surface of said casing and extending perpendicular to the axis of said motor,

each of said pair of spaced mounting elements being selectively engageable with said single mounting element to provide the sole support for said fan,

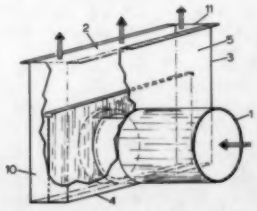
whereby the orientation of said fan may be selectively reversed by reversing the engagement of the spaced mounting elements with said single mounting element with the bulk of said casing located remote from said door to avoid interference with said door regardless of the position of said fan.

4,412,479

GAS FLOW ARRANGEMENT

Johannes H. W. Ouwerkerk, Driehuis; Albert Kramer, Enkhuizen, and Johannes W. Mooij, IJmuiden, all of Netherlands, assignors to Estel Hoogovens B.V., Netherlands

Filed Apr. 21, 1981, Ser. No. 256,014
Claims priority, application Netherlands, May 8, 1980, 8002639
Int. Cl.³ F24F *13/02*
U.S. Cl. 98—36 **8 Claims**



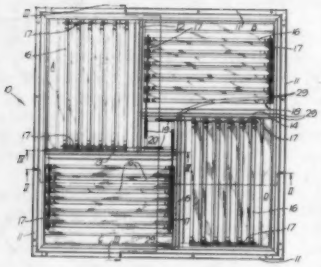
1. In a gas flow arrangement in which gas flowing axially along a cylindrical pipe is directed into a flow chamber having

a gas exit at one side thereof and communicating with said pipe at right angles to the axis of said pipe in which the gas flow is generally at right angles to the flow in the pipe,
the improvement that:
in order to achieve a highly uniform flow at a given cross sectional area transverse to the flow in said flow chamber the pipe is closed by an end wall and has, at one side thereof and close to said end wall, at least two mutually axially spaced apertures opening into said flow chamber for flow of gas from the pipe into the chamber toward said exit, each of said apertures having four edges located in planes radial to and at right angles to the axis of said pipe, and there being, in the pipe between each axially adjacent pair of said apertures, a flow constricting partition wall having through it a circular apertures concentric with the pipe axis.

4,412,480
DIRECTIONAL OUTLET ASSEMBLY

Raymond S. Cardiff, 40 Carnaby St., Macgregor Queensland, Australia

Filed Sep. 1, 1981, Ser. No. 298,413
Claims priority, application Australia, Sep. 3, 1980, PE 5387
Int. Cl.³ F24F *13/06*
U.S. Cl. 98—40 D **9 Claims**



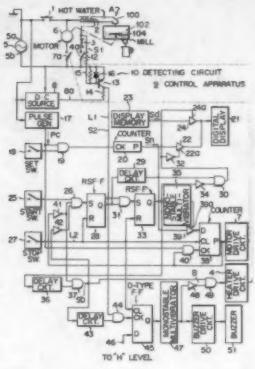
1. A multi-directional air outlet assembly including a plurality of louvre assemblies each comprised of a plurality of parallel pivoted louvre blades and each operable by common control means between a closed attitude and an open attitude for deflecting air flow through said outlet assembly for simultaneous discharge, said blades of each assembly being disposed at an angle to said blades of each adjacent assembly so that air discharge from each assembly is in a different direction to air discharge from an adjacent assembly, said common control means being so interconnected to said louvre assemblies that upon actuation of said common control means each said louvre assembly will be opened from its closed attitude to a preselected extent.

4,412,481
COFFEE MAKER

Hiroyuki Oota, Iwakura, and Ryuuho Narita, Nagoya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 19, 1982, Ser. No. 340,634
Claims priority, application Japan, Jan. 22, 1981, 56-8194; Jan. 23, 1981, 56-9431; Jan. 23, 1981, 56-9432; Jan. 23, 1981, 56-9433; Jan. 23, 1981, 56-9434
Int. Cl.³ A47J *31/42*
U.S. Cl. 99—280 **20 Claims**

19. The coffee maker comprising a mill mechanism for milling coffee beans held in a case to provide coffee powder and a drip mechanism for pouring hot water into the coffee powder to make coffee:
a heater circuit with a series circuit connected across an AC power source and including a main switch, a heater contained in said drip mechanism, a normally closed thermal switch which is turned off when the temperature of said heater exceeds a given value, and a heater switch for said heater which is turned on after said main switch is turned on; and

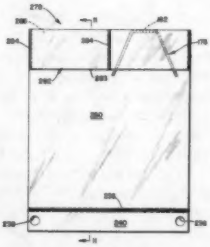


a detecting circuit connected with a signal take-out node of a given end of said series circuit and for detecting that said main switch is ON and at least one of said thermal switch and said heater switch is OFF.

4,412,482
DISPOSABLE COOKING BAGS

Alexander P. Janssen, 28 Old Farm Rd., Bellair, Charlottesville, Va. 22903

Continuation of Ser. No. 890,791, Mar. 27, 1978, abandoned, which is a continuation of Ser. No. 702,090, Jul. 2, 1976, which is a continuation-in-part of Ser. No. 637,966, Dec. 5, 1975, Pat. No. 4,005,645, which is a continuation-in-part of Ser. No. 327,658, Jan. 29, 1973, Pat. No. 3,946,654. This application Apr. 14, 1980, Ser. No. 139,742
Int. Cl.³ A47G *27/10*
U.S. Cl. 99—403 **13 Claims**



1. A disposable comestibles-containable bag for cooking utensils and accessories having a vertically extending bag-supporting means, said bag consisting in its entirety of a flexible, impermeable material and having side walls and closable open and closed ends at the opposite ends of the side walls, said bag being adapted to be disposed in said bag-supporting means in a generally vertical orientation with its closable end uppermost; said bag also having means at the closed end of the bag which are adapted to be used to effect connections between the bag and the bag-supported means, the means at the closed end of the bag being spaced at intervals around said bag and being so

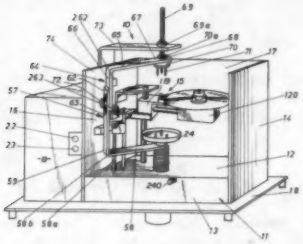
constructed as to be capable of producing mechanical connections between the closed end of the bag and the lower part of the bag-supporting means; and said bag further having means adjacent and at intervals around the closable end of the bag which are adapted to be used to effect connections between the closable end of the bag and the bag-supporting means and thereby make it possible to open and close said end of the bag by manipulation of said bag-supporting means.

4,412,483

SPIRAL MEAT SLICER

Poul E. Hoegh, San Jose, Calif., assignor to Country Baked Hams, Inc., San Jose, Calif.

Filed Nov. 20, 1980, Ser. No. 209,197
Int. Cl.³ A23N 7/00; A47J 17/00
U.S. Cl. 99—538 **6 Claims**



1. A spiral meat slicer for automatically forming a continuous spiral slice on a cut of meat having an irregularly shaped bone extending therein, comprising means for mounting said cut of meat on a rotatable platform, with said bone as a substantially vertical axis about which to rotate said cut of meat, means for clamping said cut of meat on said rotatable platform, blade support means pivotally mounted in said spiral meat slicer for rotation about an axis substantially parallel to rotative axis of said rotatable platform, said blade support means pivoting in a stationary, substantially horizontal plane, a disk blade mounted rotatably and substantially horizontally on said blade support means, drive motor means mounted on said spiral meat slicer, means for rotating said rotatable platform and means for moving said rotatable platform vertically upwards with respect to said blade to spirally slice said cut of meat, means for automatically engaging and disengaging said means for rotating and moving said rotatable platform upwards, means for moving said rotatable platform up to uppermost start position after said cut of meat has been sliced, means for selectively retaining said blade away from said rotational axis of said rotational platform, means for selectively releasing said retaining of said blade, means for biasing said blade toward said rotational axis of said rotational platform, transmission means from said drive motor means to said blade to rotate said blade and to said rotatable platform to rotate said rotatable platform and to move said rotatable platform vertically upwards and electric circuit means including switches and solenoids for rendering operation of said spiral meat slicer automatic.

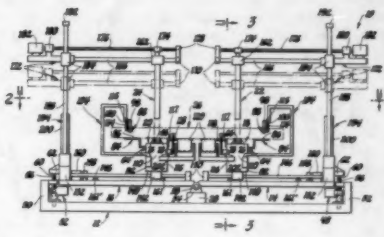
4,412,484

STRAPPING MACHINE

William J. Beethem, Cheboygan, and Lynn D. Rumsey, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1982, Ser. No. 408,633
Int. Cl.³ B65B 13/04
U.S. Cl. 100—7 **5 Claims**

1. A strapping machine for applying a pair of straps about a package, said strapping machine comprising first and second strap-feeder and tensioning devices each of which includes a strap-feed guide member and a strap-return guide member aligned along a first axis; first and second chutes located adjacent said first and second strap-feeder and tensioning devices respectively, each of said first and second chutes having a strap-entry portion and a strap-exit portion; means operatively connected to each of said chutes for moving said chutes between a first position wherein said strap-entry portion and said strap-exit portion are axially aligned with said strap-feed guide member and said strap-return guide member respectively of the associated strap-feeder and tensioning device for applying one strap to said package, and a second position wherein said



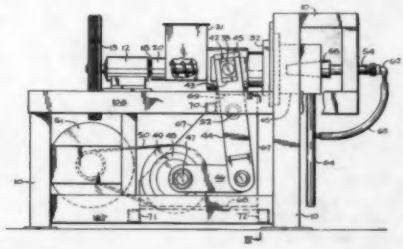
strap-entry portion and said strap-exit portion are spaced vertically from said strap-feed guide member and said strap-return guide member of said associated strap-feeder and tensioning device for receiving said package; and means supporting each of said first and second strapping feeder and tensioning devices and its associated chute for adjustable and coordinated movement along a second axis which is perpendicular to said first axis so as to vary the distance between said first and second strap-feeder and tensioning devices and thereby vary the distance between said pair of straps.

4,412,485

PRESS FOR EXPRESSING LIQUID FROM A MASS

Douglas B. Brown, Ottawa, Canada, assignor to Stake Technology Limited, Ottawa, Canada

Filed Mar. 16, 1981, Ser. No. 243,699
Claims priority, application Canada, Mar. 27, 1980, 348560
Int. Cl.³ B30B 9/12
U.S. Cl. 100—117 **4 Claims**



1. A press for expressing liquid out of a mass comprised of a particulate soild material portion and a liquid material portion, said press being of the type having feeding means for feeding the mass through an inlet portion of the press; compression means for compressing said mass along a predetermined path within a housing means while advancing said mass to a discharge end thereof, and liquid passage means comprised in a portion of a wall of said housing means for removal of a part of the liquid portion to this reduce liquid content in said mass, wherein:

(a) said housing means is a hollow tubular housing whose

one axial end is generally coincident with said inlet portion, the other axial end of said housing means being generally coincident with said discharge end;

(b) said compressor means is of the type including a conveyor screw combined with a reciprocating annular sleeve, said conveyor screw being co-axial with said housing means, a portion of said conveyor screw being rotatably disposed inside said annular sleeve whose outside diameter generally corresponds to the inside diameter of said housing means;

(c) said annular sleeve is slidable within said hollow housing means and is operatively associated with a first drive means for imparting to said sleeve a reciprocating motion relative to said housing means and to said conveyor screw, in a direction generally co-axial with said housing means; the frequency of the reciprocating motion being in excess of three cycles per second;

(d) said annular sleeve has a free end face portion of a generally flat, annular configuration, facing said discharge end;

(e) said liquid passage means is a plurality of closely spaced passage openings extending generally radially through a portion of the wall of said housing means to thus form a perforate section of said wall, said perforate section having an inside axial end relatively remote from said discharge end and an outside axial end relatively close to the discharge end;

(f) said annular sleeve and said liquid passage means being so arranged that said free end face portion thereof is disposed between said inside axial end and said outside axial end of the perforate section when the free end face portion of the sleeve is at the end of the stroke directed toward said discharge end, the axial distance travelled by said face portion within said perforate section being less than one-half of the total axial distance of said perforate section.

4,412,486

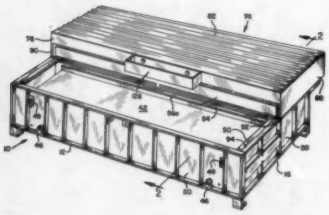
PRESS CONSTRUCTION

Frank W. Leonard, P.O. Box 5634, Boise, Id. 83705

Filed Aug. 31, 1981, Ser. No. 298,075

Int. Cl.³ B30B *15/06*

U.S. Cl. 100—229 R **6 Claims**



1. A press construction comprising:

(a) support means including an upright frame having front, rear and side portions as well as top and bottom portions,

(b) first platen means,

(c) said first platen means having a pressing surface for supporting articles in the press and being movable upwardly in a pressing position and downwardly in a retracted position,

(d) lift means between said support means and said first platen means arranged to move said first platen means upwardly to a presssing position,

(e) second platen means having a longitudinal pressing surface facing the pressing surface of said first platen means to form an abutment for articles being compressed upon operation of said lift means,

(f) movable support means on said frame and second platen means extending from front to rear,

(g) said movable support means being disposed adjacent an upper portion of said frame,

(h) said second platen means being movable on said movable support means relative to said first platen means in a plane parallel with said pressing surfaces to move between an advanced pressing position in overlapping relation with said first platen means for pressing articles by operation of said lift means and a retracted position for loading and unloading articles onto said first platen means,

(i) an opening in said frame above said first platen means for loading articles onto said first platen means and removing them,

(j) said second platen means in its advanced pressing position spanning said opening and closing the same,

(k) a hood supported on said frame,

(l) said hood having a front opening for receiving and concealing said second platen means in its retracted position,

(m) said hood having a rear extension projecting beyond the rear portion of said frame to accommodate said second platen means in said retracted position,

(n) and releasable means securing said hood either in its rearwardly extending position for use of the press in pressing operations or for securing said hood in a forward position for compacting the press for shipment.

4,412,487

APPARATUS FOR MANUFACTURING A PRINTED PLASTIC ARTICLE

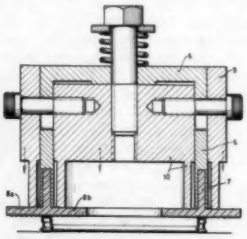
Roelof Muis, Vroomshoop, and Kornelis Heerder, Goor, both of Netherlands, assignors to Wavin B.V., Netherlands

Filed Dec. 30, 1980, Ser. No. 221,305

Claims priority, application Netherlands, Jan. 8, 1980, 8000104

Int. Cl.³ B41F *17/00*

U.S. Cl. 101—41 **4 Claims**



1. Apparatus for printing on a plastic article having an upwardly bent portion between a flat center section and a drooping circumferential rim, said apparatus comprising:

an annular deformable carrier for carrying a coloring composition;

axially movable means, cooperating with said carrier, for bending a part of the carrier adjoining the upwardly bent portion and a part of the carrier adjoining the circumferential rim of the plastic article, said axially movable means having been adapted for embracing part of the upwardly bent portion perpendicularly of the flat center section;

wherein said axially movable means are concentrically positioned adjoining a part of the carrier which is adapted to be pressed against the top of the upwardly bent portion; and

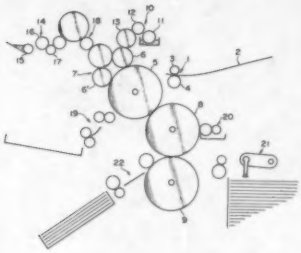
wherein said axially movable means include a first cylinder being connected to the carrier and being positioned between two concentrically positioned cylinders, said first cylinder and said two concentrically positioned cylinders being adapted for axial displacement with respect to each other in order to deform annular parts of the carrier.

4,412,488

AUTOMATIC PRINTING MACHINE

Koji Ishii, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed May 20, 1981, Ser. No. 265,320
Claims priority, application Japan, May 26, 1980, 55-70684
Int. Cl.³ B41F 7/00
U.S. Cl. 101—142 6 Claims



1. An automatic printing machine comprising plate loading device for delivering a printing plate onto a plate cylinder;

an operating shaft;

an operating lever rigidly coupled to said operating shaft and movable sequentially to a plurality of operating positions;

a plurality of cams provided on said operating shaft;

said plate loading device, a water duct roller mechanism and a form roller mechanism being operatively coupled to said operating shaft and said cams in such a manner that said plate loading device, water duct roller mechanism and form roller mechanism are operated as said operating shaft is turned;

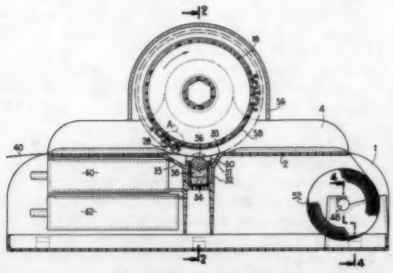
said cams each having a shape and orientation relative to each other and said shaft so that, as said operating lever is turned from a first neutral position to a second position said water duct roller mechanism is activated, as said operating lever is turned to a third position said form roller mechanism is activated to cause form rollers to contact said plate cylinder, and then said plate loading device is activated to perform a plate loading operation.

4,412,489

SMALL PRINTING MACHINE

Claude-Alain Duhamel, Paris, France, assignor to Librairie Fernand Nathan, Paris, France

Filed Sep. 4, 1981, Ser. No. 299,488
Claims priority, application France, Feb. 11, 1981, 81 02666
Int. Cl.³ B41F 5/00, 27/06
U.S. Cl. 101—212 14 Claims



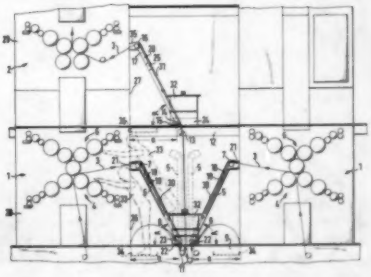
1. A printing machine comprising a table for guiding paper to be printed, means defining a slot extending transversely of the table, a stick of coloured greasy chalk disposed parallel to and located in said slot, a rotary drum located above said slot and rotatable about an axis parallel to said slot and having on a part of an outer surface thereof ribs which are disposed on a first imaginary geometric cylinder coaxial with said drum and are for receiving and hooking printing forms, printing forms which are in hooked relation to said ribs and have reliefs, the reliefs defining outer surfaces which are disposed on a second imaginary geometric cylinder which is coaxial with said drum and has a radius which exceeds the radius of said first imaginary geometric cylinder, and means for biasing the stick of chalk and said outer surfaces of said printing forms against one another whereby, upon rotation of the drum with a sheet of paper between the drum and the stick of chalk, said outer surfaces of the reliefs apply the paper against the stick of chalk which prints the shape of the outer surfaces of the reliefs on a side of the paper remote from the drum as the paper is displaced transversely across the stick of chalk by the rotation of the outer surfaces of the reliefs about said axis.

4,412,490

PAPER WEB GUIDING MECHANISM

Heinrich K. Grosshauser, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer AG, Wurzburg, Fed. Rep. of Germany

Filed Jan. 20, 1982, Ser. No. 341,027
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104562
Int. Cl.³ B41F 5/04
U.S. Cl. 101—219 3 Claims



1. A paper web guiding mechanism for use with a printing unit in a web-fed printing machine to afford access to component parts of printing couples in the printing unit, said paper web guiding mechanism comprising:

a paper guide frame which is capable of being inclined at an angle α againt side frames of the printing unit;

paper guide rollers rotatably secured to upper and lower ends of said paper guide frame, said paper guide rollers defining a path of paper web travel;

an operating floor pedestal secured to the printing machine adjacent said lower end of said paper guide frame; and

a cover sheet secured to said paper guide frame on a side of said paper guide frame away from the printing unit.

4,412,491

SYSTEM FOR SENSING AN INKING MEMBER IN A VALUE PRINTING DEVICE

Danilo P. Buan, Easton, and Alton B. Eckert, Jr., Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,955
Int. Cl.³ B41F 3/40
U.S. Cl. 101—363 7 Claims

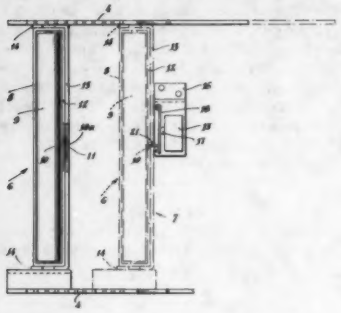
1. In a value printing device, a system for electronically sensing the presence of a new inking member, comprising:

(a) a cartridge having a housing containing an inking member, the housing having an opening with a detachable member therein;

(b) sensing means comprising:

i. contacting means mounted in said device substantially in alignment with said housing opening; and

ii. electrical sensing means mounted stationary within the device and activatible by said contact means for generating signals; and



(c) means for moving said cartridge with respect to said sensing means such that said contact means is caused to erter said housing opening upon movement of said cartridge; wherein when said contacting means contacts said detachable member is displace the same from said opening; said electrical sensing means is caused to generate at least one of said signals in response to the force exerted on said contacting means by said detachable means.

4,412,492

PRIMING COMPOSITION AND TECHNIQUES

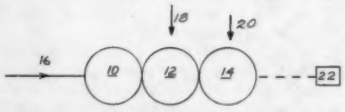
Richard N. Knights, 163 Hucclecote Rd., Gloucester Gloucestershire GL3 3TX, England, and Peter H. Whittall, Penkridge, England, assignors to IMI Kynoch Limited, Birmingham, England, by said Peter H. Whittall

Continuation of Ser. No. 722,071, Sep. 3, 1976, abandoned. This application Apr. 1, 1980, Ser. No. 132,665

Claims priority, application United Kingdom, Sep. 11, 1975, 37385/75

Int. Cl.³ C06C *7/00*

U.S. Cl. 102—204 **8 Claims**



1. In a method of priming explosive devices by incorporating a discrete body of priming explosive comprising a primary explosive compound in a hollow container forming part of each device, the improvement comprising the steps of providing in each said container predetermined quantities of materials comprising relatively insensitive components that can chemically react together forming said primary explosive compound and chemically reacting together said components in situ in each of said containers so as to form the primary explosive compound of each of said discrete bodies.

4,412,493

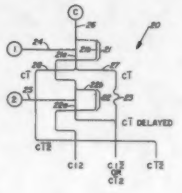
EXPLOSIVE LOGIC SAFING DEVICE

Denis A. Silvia, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1981, Ser. No. 317,961

Int. Cl.³ F42B *3/10, 15/00*

U.S. Cl. 102—275.9 **30 Claims**



25. A device for initiating selectable warhead options, comprising:

an inlet explosive trail having an inlet detonation signal;

a plurality of outlet explosive trails conveying the detonation signal to one or more warhead options; and

an explosive logic network connecting the inlet explosive trail and plurality of outlet explosive trails such that the inlet detonation signal can be conveyed to one or more of the warhead options.

4,412,494

Patent Not Issued For This Number

4,412,495

TOTAL BODY PROTECTIVE SHIELD

Wilfred A. Sankar, 3209 Snyder Ave., Apt. 10, Brooklyn, N.Y. 11226

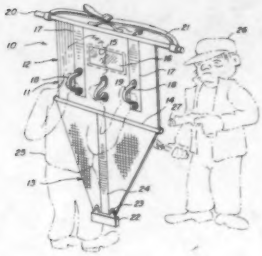
Filed May 7, 1981, Ser. No. 261,603

Int. Cl.³ F41H *5/06*

U.S. Cl. 109—49.5 **1 Claim**

1. A total body protective device, comprising, in combination, a pair of flexible panel pieces made of bullet-proof fabric for serving as a shield in front of a person, one said panel piece comprising an upper panel piece while the other comprises a lower panel piece assembled together; an upper rod mounted at the top edge of said upper panel piece and a center rod mounted between said upper and said lower panel pieces; an upper of said panel pieces including a plurality of three handles on one side thereof for holding said device vertically and also including a central window of bullet-proof material so as to observe therethrough; both said panel pieces including elongated flexible spring steel strips secured onto one side thereof so as to permit rolling up said panel piece when not in use and quickly unrolling of said panel pieces for instant use and retain said panel pieces flat when use requires such; two of said strips being secured onto said upper panel piece spaced apart and parallel to each other, both extending from said upper rod and terminating spaced from said middle rod, said lower panel

piece having a single of said strips secured thereto and extending from said center rod to the lower edge of said lower panel, two of said handles being respectively secured onto said two



strips, said strips together with said rods forming a rigid frame for said panel pieces when unrolled, and a lower of said panel piece has a detachable weight snap fastened to a lower edge thereof and coupled to the strip terminating at that edge.

4,412,496

COMBUSTION SYSTEM AND METHOD FOR A COAL-FIRED FURNACE UTILIZING A LOW LOAD COAL BURNER

Norman K. Trozzi, West Caldwell, N.J., assignor to Foster Wheeler Energy Corp., Livingston, N.J.

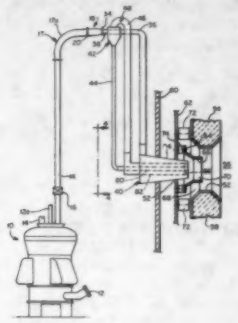
Filed Apr. 27, 1982, Ser. No. 372,269

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **15 Claims**

1. A combustion system for a coal fired furnace, said system comprising a source of a mixture of pulverized coal and air, splitting means for splitting said mixture into two separate streams, a first nozzle means connected to said splitting means for receiving one of said streams and discharging said stream into said furnace, separating means connected to said splitting means for receiving the other of said streams and for separating a quantity of air from the mixture of coal and air in said other stream, second nozzle means connected to said separating means for discharging the remaining portion of said mixture into said furnace, and third nozzle means connected to said separating means for discharging said quantity of air into said furnace in a combustion supporting relationship to said remaining portion of said mixture.

12. A method of operating a coal fired furnace, said system comprising the steps of splitting a mixture of pulverized coal and air into two separate streams passing one of said streams directly into said furnace through a first nozzle, separating a quantity of air from the mixture of coal and air in said other stream, passing the remaining portion of said mixture into said furnace through a second nozzle, and passing said quantity of



air into said furnace through a third nozzle in a combustion supporting relationship to said remaining portion of said mixture.

4,412,497

APPARATUS FOR DRIVING THREAD LEVERS ON EMBROIDERY MACHINES

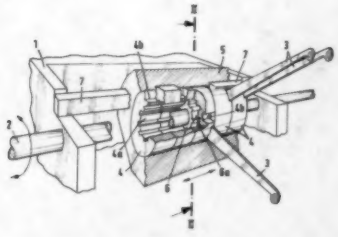
Wolfgang Teetz, Kerken; Heinz-Georg Slomma, Viersen, and Hans-Gerd Ripkens, Goch, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,198

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1980, 3007473

Int. Cl.³ D05C *11/16*

U.S. Cl. 112—96 **7 Claims**



1. In a device for driving at least one of a plurality of thread levers on multi-needle embroidery machines in which the thread levers of the needles disconnected at the time can be uncoupled by displaceable coupling elements from an oscillating drive shaft, the improvement wherein

said coupling elements comprise coupling sleeves,

a housing,

said coupling sleeves are formed with grooves, respectively, and are mounted jointly in said housing,

the thread levers are arranged on said coupling sleeves, respectively,

said coupling sleeves surround the drive shaft and are mounted displaceable with said housing in the longitudinal direction of the drive shaft,

holding rails mounted fixed in position extend parallel to the drive shaft and are adapted to engage in said grooves of said coupling sleeves,

a coupling piece means is fastened to the drive shaft, at least one of the coupling sleeves respectively can be coupled to the drive shaft by said coupling piece means, while the other of said coupling sleeves are held fast, in non-rotatable manner, together with said housing by said holding rails which engage into said grooves of said other coupling sleeves.

4,412,498

CONTROL DEVICE FOR A DIFFERENTIAL FEED OF A SEWING MACHINE

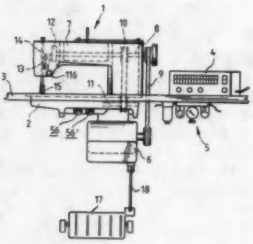
Hans Scholl, Oerlinghausen-Lipperreihe, Fed. Rep. of Germany, assignor to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

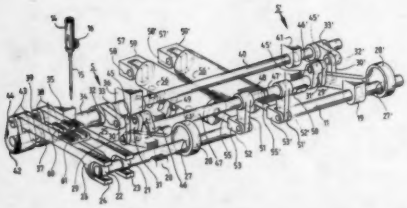
Filed Apr. 22, 1982, Ser. No. 370,797

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118964

Int. Cl.[3] D05B *27/08*

U.S. Cl. 112—313 6 Claims





1. A control device for a sewing machine with stitch forming means including a needle and differential feed means for advancing a workpiece having at least one ply in a sewing direction comprising:

first feed means arranged behind said needle with respect

a first feed unit imparting a feed rate to said first feed means;

second feed means arranged in front of said needle with respect to said sewing direction; and

a second feed unit imparting a feed rate to said second feed means;

said control device including:

a control box;

a control device controlled by said control box for regulating the relation of said feed rates imparted to said first and said second feed means comprising:

solenoid valves operated by said control box and

a pneumatic cylinder having individual cylinders arranged in series and operated by said solenoid valves.

4,412,499

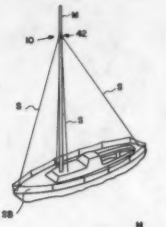
RIGGING CONNECTION ASSEMBLY

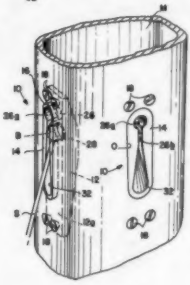
Eric R. D. Hall, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.

Continuation of Ser. No. 164,537, Jul. 2, 1980, abandoned, which is a continuation of Ser. No. 923,824, Jul. 12, 1978, abandoned. This application Apr. 29, 1981, Ser. No. 258,680

Int. Cl.[3] B63H *9/04*

U.S. Cl. 114—108 3 Claims





1. A rigging connection assembly for connecting a stay to a mast or other support structure comprising:

A. a round ball on one end of the stay,

B. a tang adapted to be connected to the mast or other support structure, said tang having an exposed front face with a recessed edge margin defining a flange and a rear face for positioning inside the mast so that the flange engages the inside wall of the mast and the front face is flush with the outside wall of the mast;

C. means defining a vertical keyhole in said tang, said keyhole having a cylindrical upper head portion extending from the front face completely through to the rear face of said tang and being sized to snugly receive said ball, and a lower neck portion communicating with said upper head portion and being sized to receive the stay, said lower neck portion including a downwardly extending trough which is recessed below the front face of said tang but which does not extend completely through to the rear face of said tang and which is tapered such that its depth below the front face decreases, and its width increases, with distance from said upper head portion, and

D. means at the rear face of said tang defining a ball-retaining pocket, said pocket being generally cylindrical and being spaced vertically away from said keyhole head portion so that when the stay is in a first orientation relative to said tang, said ball can be inserted through said keyhole head portion from the front face of said tang and engaged in said pocket at the rear face of said tang and when the stay is in a second orientation relative to said tang, said ball is retained in said pocket with the stay projecting through said keyhole neck portion and said trough, said ball is free to swivel both laterally and vertically in said pocket and the stay is free to swivel both laterally and vertically in said trough.

4,412,500
DRIVE MECHANISM FOR SHIPS OR THE LIKE COMPRISING A MAIN PROPELLER AND AN AUXILIARY MECHANISM

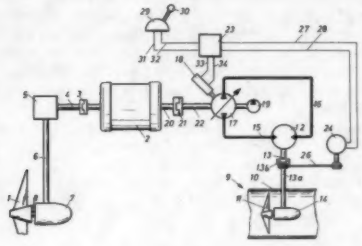
Franz Krautkremer, Spay, Fed. Rep. of Germany, assignor to Schottel-Werft, Josef Becker GmbH & Co. KG, Spay, Fed. Rep. of Germany

Continuation of Ser. No. 299,284, Sep. 4, 1981, abandoned, which is a continuation of Ser. No. 82,203, Oct. 5, 1979, abandoned. This application Sep. 27, 1982, Ser. No. 424,794

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900254

Int. Cl.³ B63H *25/46*

U.S. Cl. 114—151 **2 Claims**



1. A drive mechanism for ships or the like, comprising:

a main motor;

a main propeller or the like driven by said main motor for propelling the ship, said main motor being connected to drive said main propeller and having a speed adjustable to provide the desired main propeller speed and hence ship speed;

a maneuvering propeller or the like for lateral maneuvering of the ship;

drive means for also driving the maneuvering propeller from the main motor, the drive means comprising

(a) an adjustable hydraulic pump driven by said main motor, and

(b) a hydraulic motor driven by said adjustable hydraulic pump and connected for driving said maneuvering propeller;

a regulating means associated with said drive means for maintaining the maneuvering propeller at a chosen speed independent of main propeller speed, during and despite adjustments of the speed of the main motor in a part of its speed range to make desired changes in main propeller speed, said regulating means comprising

(a) an adjusting mechanism for the energy emitted by said adjustable hydraulic pump or absorbed by said hydraulic motor, and

(b) a regulator for adjusting said adjusting mechanism to a preselected energy output, said regulator being an actual value-desired value comparison mechanism, wherein the actual value is taken from said maneuvering propeller, and the desired value is adjustable by an advancing mechanism by means of a lever or the like, the actual value being taken from said maneuvering propeller by means of a tachogenerator;

said main motor and said maneuvering propeller being sized such that in the higher part of the speed range of said main motor, starting with a main motor speed n_S which is approximately 75% of the maximum main motor speed, the sum of the output of said main propeller and the maximum output of said maneuvering propeller permitted by said regulating means exceeds the output available from said main motor;

the stroke volume of said pump being dimensioned such that with said lever at maximum deflection, in the range from the main motor idling speed n_L up to a main motor speed n_2 of approximately 50% of the main motor maximum speed, the output of the pump is determined by its stroke volume, and above main motor speed n_2 the output of said pump is limited by said regulating means; and

first and second clutch means interposed between said main motor and respective ones of said main propeller and said adjustable hydraulic pump, and individually actuable for alternately applying energy from said main motor (1) to said main propeller, (2) to said maneuvering propeller or (3) at low speeds of said main motor, simultaneously to said main propeller or the like and maneuvering propeller, such that at said low speeds said lever is actuable to vary the amount of energy supplied by said main motor to said maneuvering propeller independent of variations in the amount of energy supplied by said main motor to said main propeller.

4,412,501
SHIP-BURNE OIL DISPERSANT PROCEDURE AND APPARATUS

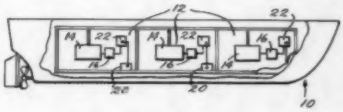
Murray A. Davis, 4874 Cote des Neiges Blvd., Apartment 1001, Montreal, Canada H3V 1H4

Continuation of Ser. No. 45,333, Jun. 4, 1979, Pat. No. 4,301,006. This application Jun. 5, 1981, Ser. No. 270,872

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ B63B *35/00*

U.S. Cl. 114—270 **20 Claims**



1. An oil disperser system comprising:

means for automatically detecting a leak of oil from a first container, comprising an oil tank in a ship, into a body of water;

means for holding an oil dispersant;

means, responsive to said detecting means, for automatically releasing said oil dispersant from said dispersant holding means into said oil so that said oil is dispersed in said body of water; and

said ship supporting said holding means and said detecting means.

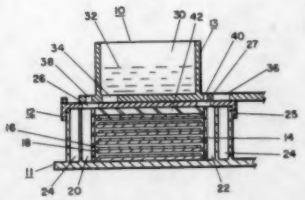
4,412,502
APPARATUS FOR THE ELIMINATION OF EDGE GROWTH IN LIQUID PHASE EPITAXY

Suei-Yuen P. Lien, West Windsor Township, Mercer County, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 277,412, Jun. 25, 1981, Pat. No. 4,390,379. This application Feb. 17, 1983, Ser. No. 467,402

Int. Cl.³ B05C *3/109;* **H01L** *21/208*

U.S. Cl. 118—412 **6 Claims**



1. An apparatus useful for growing single crystal semiconductor layers by liquid phase epitaxy comprises a substrate

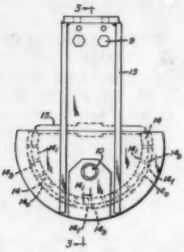
carrier having at least one recess therein for holding one or more substrates and a growth solution source carrier which is slidable over the substrate carrier, said source carrier having at least one hole therein for containing molten growth material and including a well around the periphery of the recess for containing a material capable of reducing the heat loss from the edges of the recess.

4,412,503

SINKER ASSEMBLY FOR HOT-DIP COATING APPLICATIONS

Frank W. Bakewell, Apollo; Thomas E. Nicely, Delmont, and C. Donald Stricker, Monroeville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1982, Ser. No. 402,472
Int. Cl.³ B05C 3/132; B60B 7/04
U.S. Cl. 118—420 8 Claims



1. A sinker assembly for guiding wire through a coating bath, comprising,

a frame member, a lower portion of which has an arcuate peripheral surface;

a series of at least three truncated, pie-shape segments formed from a refractory material and shaped such that when the radial edges thereof are abutted against each other, they form a concentric annular belt encircling at least a major portion of said frame arcuate peripheral surface, the outer arcuate surfaces of said segments having a groove, said series of segments being arranged such that the grooves therein line up to form a circumferential axis for conducting wire therealong;

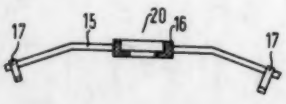
a housing, maintaining the inner arcuate surfaces of said segments in sliding contact with said farme arcuate peripheral surface and preventing lateral movement of the segments such that said circumferential groove axis is maintained in a substantially vertical plane through which said wire travels.

4,412,504

DEVICE FOR HOLDING SUBSTRATE WAFERS

Bonu Bonu, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,716
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1980, 3028536
Int. Cl.³ B05C 11/14, 13/00
U.S. Cl. 118—664 17 Claims



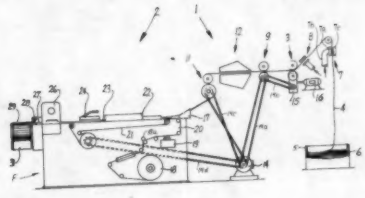
1. Device for holding substrate wafers comprising a plurality of circular rings disposed concentrically about a middle part and having disposed thereon at least one bearing surface, respectively, extending towards the interior of the respective ring, and means for yieldingly pressing the substrate wafers against the respective bearing surfaces, said means for yieldingly pressing the substrate wafers against the respective bearing surfaces comprising pressure springs secured to respective holding arms, said plurality of rings including a hub fastenable to said middle part, said holding arms extending radially outwardly spiderlike from said hub.

4,412,505

APPARATUS FOR APPLYING ATOMIZED LIQUID TO A RUNNING LAYER OF FILAMENTARY MATERIAL OR THE LIKE

Nikolaus Haüsler, Oststeinbek, and Adolf Helms, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 254,521, Apr. 15, 1981, Pat. No. 4,344,382.
This application Aug. 5, 1982, Ser. No. 405,346
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014807
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.³ B05B 13/02
U.S. Cl. 118—674 9 Claims



1. Apparatus for applying a liquid to a running layer, comprising a source of liquid; means for continuously transporting the layer along a predetermined path; an ultrasonic atomizing device adjacent to said path and including an atomizing surface extending at least substantially across the full width of the layer in said path, said device being operable to spray atomized liquid onto successive increments of the running layer in said path; and means for supplying liquid from said source to said atomizing device, including means for delivering to said device metered quantities of liquid.

4,412,506

ADHESIVE COATING MACHINE

Shigeru Morita, Suita, and Masami Furuhashi, Tokyo, both of Japan, assignors to Nippon Flute Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 419,064
Claims priority, application Japan, May 31, 1982, 57-92495
Int. Cl.³ B05C 5/02
U.S. Cl. 118—683 3 Claims

1. An adhesive coating machine comprising:

a nozzle disposed so as to face the passage of an object matter to be coated;

a gear pump for pressure-feeding an adhesive into said nozzle;

a drive wheel disposed with the circumferential surface thereof positioned inside said passage and rotated by said object matter to be coated during the passage thereof, thereby driving said gear pump;

a ratchet wheel disposed concentrically and integrally with said drive wheel;

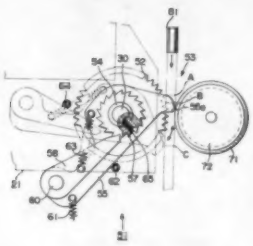
a swing arm fitted loosely and concentrically with said ratchet wheel and with said drive wheel and urged in the direction opposite the driving rotating direction of said drive wheel;

a first stopper disposed so as to face said swing arm and an-

choring said swing arm while the tip of said swing arm projects into said passage;

a ratchet pawl turnably supported by said swing arm and urged in such a direction that the tip thereof engages with said ratchet wheel; and

a second stopper disposed so as to oppose said ratchet pawl in the arrangement such that it comes into contact with said ratchet pawl and disengages the tip of said ratchet pawl from said ratchet wheel when the tip of said swing arm is pushed by said object matter to be coated and rotates in the same



direction as the driving rotating direction of said drive wheel and the tip moves back from said passage during the passage of said object matter to be coated;

said gear pump being driven by the passage of said object matter to be coated via said drive wheel;

said ratchet wheel being rotated by the return rotation of said swing arm after the passage of said object matter to be coated, thereby rotating said drive wheel in a direction opposite the driving rotating direction of said drive wheel and reversely rotating said gear pump.

4,412,507

MAGNETIC RECORDING MEDIUM MANUFACTURING DEVICE

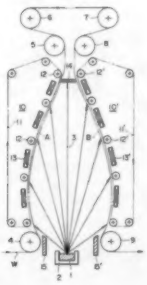
Tatsuji Kitamoto, and Ryuji Shirahata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1981, Ser. No. 284,863

Claims priority, application Japan, Aug. 14, 1980, 55-112084

Int. Cl.³ B05C *11/14*

U.S. Cl. 118—718 **9 Claims**



1. A magnetic recording medium manufacturing device comprising: a molten metal evaporating source; and means for transporting a flexible belt-shaped support above said evaporating source along a curved path formed such that all evaporated metal flow lines originating from a central point on an evaporation surface of said molten metal and contacting points on a line of said support which extends over a longitudinal length of said support where said evaporated metal flow lines contact said support from a substantially constant angle of incidence with respect to tangent lines formed at respective contact points of said support line, said tangent lines extending along a longitudinal direction of said support; and means for adjusting the position of said transporting means to vary said angle of incidence.

4,412,508

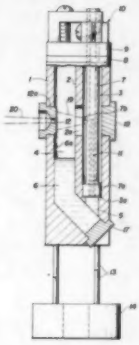
NOZZLE BEAM SOURCE FOR VAPOR DEPOSITION

Robert J. Ney, St. Petersburg, Fla., and Erich Hafner, Tinton Falls, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 216,092, Dec. 15, 1980, abandoned. This application Aug. 11, 1982, Ser. No. 407,019

Int. Cl.³ C23C *13/12*

U.S. Cl. 118—726 **3 Claims**



1. Apparatus for generating a beam of metal vapor to plate a workpiece comprising a graphite housing having top, bottom and side walls, said bottom and side walls including graphite sealing plugs, a graphite partition connected to the housing top wall and extending longitudinally within the housing parallel to the side walls, said partition dividing the housing into a source chamber, and a collimation chamber, an aperture provided in said partition interconnecting said chambers, a supply of metal to be vaporized provided in said collimation chamber, said metal having the property of not wetting or penetrating graphite, the lower end of said partition being spaced from the bottom wall of the housing to provide a flow passage between the collimation chamber and the source chamber, a graphite source tube mounted in the source chamber, the upper end of said source tube extending through the top wall of said housing, the lower end of said tube communicating with said flow passage, a wick mounted within said source tube, the lower end of said wick communicating with said flow passage, a source aperture provided in the side wall of said source tube adjacent said partition aperture, the upper end of said wick extending adjacent said source aperture, a collimation aperture formed in the side wall of said housing communicating with said collimation chamber and aligned with said source aperture, means for heating said collimation chamber to maintain a temperature below the melting point of said metal and for periodically raising the temperature to the melting point of said metal, thereby maintaining a relatively low metal vapor pressure in said collimation chamber, and means for heating said source tube to a temperature sufficient to vaporize said metal and to maintain a high metal vapor pressure within said source tube, whereby the pressure differential between the collimation chamber and the source tube creates a vapor flow through said source aperture, a substantial portion of said flow striking the wall of the collimation chamber surrounding the collimation aperture and condensing the metal to liquid, the remaining portion of the flow passing through the collimation aperture to impinge upon said workpiece, said flow passage recirculating the liquid metal from the collimation chamber to said wick

within said source tube, and including a clearance formed between said metal and said graphite walls and sealing plugs and graphite partition and source tube when said metal is in a cool state between heating cycles, said metal expanding into said clearance upon heating to the melting point without exerting force on said walls and plugs and partition and source tube.

4,412,509

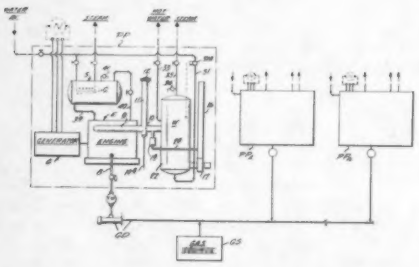
ENERGY CONVERSION SYSTEM AND COMPONENTS THEREOF

Robert B. Black, 2925 Denver St., Corpus Christi, Tex. 78404

Division of Ser. No. 58,779, Jul. 19, 1979, abandoned, and a continuation of Ser. No. 46,240, Jun. 7, 1979, Pat. No. 4,271,789, which is a continuation-in-part of Ser. No. 813,667, Jul. 7, 1977, Pat. No. 4,199,831, which is a continuation-in-part of Ser. No. 794,044, May 5, 1977, abandoned, which is a continuation of Ser. No. 620,327, Oct. 3, 1975, abandoned, which is a division of Ser. No. 568,699, Apr. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,094, Apr. 18, 1974, Pat. No. 4,025,291, which is a division of Ser. No. 369,084, Jun. 11, 1973, abandoned, which is a division of Ser. No. 192,262, Oct. 26, 1971, Pat. No. 3,844,270. This application Apr. 2, 1981, Ser. No. 250,172

Int. Cl.³ F22B *5/00*

U.S. Cl. 122—17 **14 Claims**



1. A heat exchanger for heat transfer between two fluids, the exchanger having a first bundle of tubes having tube sheets at its ends, a second bundle of tubes extended through the tubes of the first bundle and having tube sheets at its ends, the tubes of the second bundle having a smaller outside diameter than the inside diameter of the tubes of the first bundle to provide annular flow channels, the tube sheets of the second bundle being spaced axially beyond the tube sheets of the first bundle, means including the tube sheets for both bundles providing header chambers at each end of the exchanger for the tubes of the first bundle, the chamber at one end having an inlet connection for one fluid and the chamber at the other end having an outlet connection for said one fluid, and means providing headers for the tubes of the second bundle arranged axially beyond the tube sheets for the second bundle, a double walled shell, with both walls surrounding the tube bundles and having an annular chamber between the shell walls communicating with the headers for the tubes of the second bundle, the header for the second bundle at one end having an inlet connection for the other fluid and the header for the second bundle at the other end having an outlet connection for said other fluid, the inlet connections for the two fluids being located at opposite ends of the exchanger to provide directional counterflow of the two fluids respectively through the interior of the tubes of the second bundle and through said annular flow channels.

4,412,510

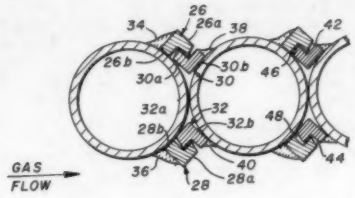
FLEXIBLE TIE FOR TANGENT TUBE CONSTRUCTION

Glenn M. Perry, and Robert P. Sullivan, both of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Del.

Filed Nov. 3, 1978, Ser. No. 957,623

Int. Cl.³ F26B *37/24*

U.S. Cl. 122—510 **6 Claims**



1. In a superheater assembly designed for employment in the flow path of a gas, the combination comprising:

a. a first tubular member supported within the superheater assembly so as to define a plane therewithin;

b. a second tubular member supported in tangential relation to said first tubular member so as to define an area of tangential engagement between said first and second tubular members, said area of tangential engagement between said first and second tubular members lying within said plane;

c. a first tie means operative for tying together said first and second tubular members at a location spaced in a first direction from said plane, said first tie means including a first tie member and a second tie member, said first tie member being attached to said first tubular member at a point spaced in said first direction from said plane so as to face in the same direction as that in which the gas flows, said second tie member being attached to said second tubular member at a point spaced in said first direction from said plane such that said second tie member is located in closer proximity to said plane that is said first tie member, said second tie member being attached to said second tubular member so as to face in a direction opposite to the direction in which the gas flows, said first tie member having a portion thereof projecting inwardly relative to said plane, said second tie member having a portion projecting outwardly relative to said plane, said inwardly projecting portion of said first tie member being engageable with said outwardly projecting portion of said second tie member in sliding relation thereto so as to effectuate a tying together of said first and second tubular members at said location spaced in said first direction from said plane; and

d. a second tie means operative for tying together said first and second tubular members at a location spaced in a second direction from said plane, said second tie means including a third tie member and a fourth tie member, said third tie member being attached to said first tubular member at a point spaced in said second direction from said plane so as to face in the same direction as that in which the gas flows, said fourth tie member being attached to said second tubular member at a point spaced in said second direction from said plane such that said fourth tie member is located in closer proximity to said plane than is said third tie member, said fourth tie member being attached to said second tubular member so as to face in a direction opposite to the direction of gas flow, said third tie member having a portion thereof projecting inwardly relative to said plane, said fourth tie member having a portion projecting outwardly relative to said plane, said inwardly projecting portion of said third tie member being engageable with said outwardly projecting portion of said fourth tie member in sliding relation thereto so as to effectuate a tying together of said first and second tubular

members at said location spaced in said second direction from said plane.

4,412,511

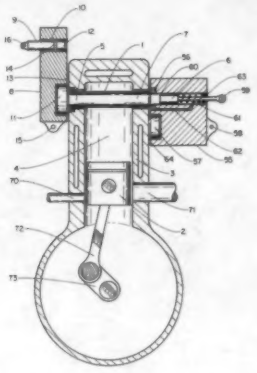
CHAR AND OIL BURNING ENGINE

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Continuation-in-part of Ser. No. 183,182, Sep. 2, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,019

Int. Cl.³ F02B *45/02;* **F02D** *19/04*

U.S. Cl. 123—23 **44 Claims**



1. A char burning engine comprising:

an internal combustion engine mechanism, comprising at least one cylinder with pistons operative therein;

a combustion chamber comprising: means for containing char fuel and ashes, so that said char fuel and ashes are mechanically separated from the piston and cylinder of the engine, said means for containing having a refuel end, with passages through said means for containing char fuel and ashes, so that air can flow readily into said char fuel during engine compression, and so that gases can flow readily out of said char fuel during engine expansion, whereby combustion of said char fuel can occur within said means for containing char fuel and ashes, each cylinder of said internal combustion engine being equipped with at least one of said combustion chambers;

means for sealing the refuel end of said means for containing char fuel and ashes through which refueling takes place, during engine compression and expansion processes, and for refueling fresh char fuel at intervals into said means for containig char fuel and ashes, said means being a refuel mechanism;

means for reloading a quantity of fresh char fuel at intervals into said refuel mechanism;

means for controlling the density of the engine intake air in order to control engine torque;

whereby said internal combustion engine becomes a char burning engine capable of running on char fuels.

4,412,512

FUEL SUPPLY SYSTEM

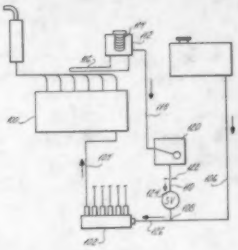
Eric C. Cottell, Private Rd., Bayville, N.Y. 11709

Continuation of Ser. No. 2,626, Jan. 11, 1979, abandoned, which is a continuation of Ser. No. 968,316, Dec. 11, 1978, abandoned. This application Oct. 23, 1980, Ser. No. 199,782

Int. Cl.³ F02M *25/02*

U.S. Cl. 123—25 E **9 Claims**

1. A fuel supply system comprising a pump and nozzle means, a source of fuel, a source of water, first conduit means through which a mixture of fuel and water is delivered to said pump, means establishing liquid flow communication from said fuel source and water source to said first conduit means at at least one location spaced from said pump, second conduit means through which the fuel and water mixture is delivered from said pump to said nozzle means, and means disposed within said second conduit means for agitating said fuel and water flowing within said second conduit means from said pump to said nozzle whereby an intimate mixture of fuel and



water is delivered to said nozzle where final emulsification takes place, said means for agitating said fuel and water in said second conduit means, said pump and said nozzle constituting means for emulsifying the fuel and water, said pump comprising pressure means for supplying pressure in said first and second conduit means and through said agitating means.

4,412,513

WATER-COOLED INTERNAL COMBUSTION ENGINE WITH DIRECT FUEL INJECTION

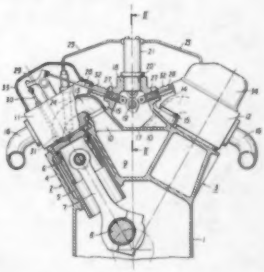
Bertram Obermayer; Josef Greier, both of Graz, and Walter Mandl, St. Pölten, all of Austria, assignors to Simmering-Graz-Pauker AG, Vienna and AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik mbH, Graz, both of, Austria

Filed Feb. 9, 1981, Ser. No. 232,550

Claims priority, application Austria, Feb. 8, 1980, 704/80

Int. Cl.³ F02M *39/02;* **F02B** *67/02*

U.S. Cl. 123—55 VE **2 Claims**



1. A water-cooled, four stroke internal combustion engine which includes

a V-shaped cylinder block which includes a number of cylinders, the cylinders being arranged in two banks, said V-shaped cylinder block defining a V-shaped space between the two cylinder banks therein, the cylinders in each said bank being spaced apart and including operable inlet and exhaust valves at their upper ends and individual liners which define coolant spaces therearound,

flat upper wall means extending from said cylinder banks at a point coincident with the upper ends of the cylinders in each said bank across the V-shaped space so as to form a receiving chamber for combustion air therewith, said wall

means being unitary with the cylinder block and providing structural reinforcement thereto,

means forming a housing above the receiving chamber in the V-shaped space, said upper wall means also constituting the lower wall of the housing, said means forming the housing also being unitary with the cylinder block,

a camshaft located within said housing and centrally positioned above the receiving chamber, said camshaft being oriented in parallel with said cylinder banks in the cylinder block,

a number of push rods, each push rod extending between a respective inlet valve and exhaust valve of a cylinder to a point cooperable with the camshaft in the housing, and

a number of individual pumps, each pump being cooperable with the camshaft in the housing for injecting fuel into a respective cylinder.

4,412,514

LOW NOISE LEVEL INTERNAL COMBUSTION ENGINE

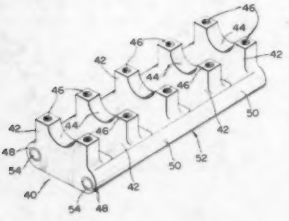
Yoshikazu Hayakawa, Yokosuka, and Naoki Ogawa, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 20, 1981, Ser. No. 255,768

Claims priority, application Japan, Apr. 21, 1980, 55-54256[U]

Int. Cl.³ F02F *7/00*

U.S. Cl. 123—195 R **6 Claims**



1. An internal combustion engine having a cylinder block extending along a longitudinal axis and being formed with a plurality of main bearing carrying sections having downwardly facing ends, comprising:

a bearing support beam structure extending along a longitudinal axis and being secured to the cylinder block and including a plurality of main bearing carrying sections having upwardly facing ends which are made of an aluminum alloy and which cooperate respectively with said main bearing carrying sections of the cylinder block, the longitudinal axis of said bearing support beam structure extending parallel to the longitudinal axis of the cylinder block; and

a steel pipe securely disposed through and in contact with all the main bearing carrying sections of said bearing support beam structure and extending in parallel with the longitudinal axes of the cylinder block and said bearing support beam structure, wherein said main bearing carrying sections of said cylinder block are located above said main bearing carrying sections of said bearing support beam structure and are aligned along the longitudinal axis of the cylinder block with the ends of respective main bearing carrying sections being secured together and vertically disposed with respect to the cylinder block.

4,412,515

LINE MULTICYLINDER INTERNAL COMBUSTION ENGINE

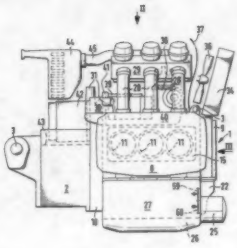
Josef Fritzenwenger, Anzing, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 2, 1980, Ser. No. 155,661

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922695

Int. Cl.³ F02B *77/14*

U.S. Cl. 123—198 E **6 Claims**



3. An internal combustion engine comprising an engine block including a cylinder-crank housing means having disposed therein a plurality of approximately horizontal cylinders and a cylinder head mounted on the housing means, a piston means reciprocally mounted in each cylinder, an approximately horizontally disposed crank shaft means for reciprocally displacing the piston means in the respective cylinders, a housing part connected to and disposed below the cylinder-crank housing means, an exhaust system beginning at an underside of the cylinder head, a part of the exhaust system extending next to said housing part, a first housing cover means disposed on the cylinder head and extending in a longitudinal direction of the crank shaft means, a second housing cover means disposed on the cylinder-crank housing means in an area of the crank shaft means and extending in a longitudinal direction of the crank shaft means, means for cooling the engine mounted on the front end of the engine above an upper forward edge of the engine block, at least one first auxiliary unit for the engine disposed on top of the engine block behind the cooling means, at least one second auxiliary unit for the engine accommodated by the housing part, a first auxiliary drive shaft being located in the housing immediately below the cylinders, means are provided for drivingly connecting one end of the auxiliary drive shaft to one end of the crank shaft means, a drive flange means is provided on said one end of said first auxiliary drive shaft for forming a power take-off from the engine, a second auxiliary shaft is located in the cylinder crank housing means directly above the cylinders, driving means are provided for drivingly connecting said second auxiliary shaft with said crank shaft means, a starting spur gear being provided at one end of the second auxiliary shaft in the vicinity of said driving means, the second auxiliary shaft driving a dynamo which forms one of the first auxiliary units disposed on the top of the engine, and said starting gear being disposed on a portion of the second auxiliary shaft extending beyond the means for drivingly connecting the same with the crank shaft means.

4,412,516

LOW-NOISE LEVEL INTERNAL COMBUSTION ENGINE

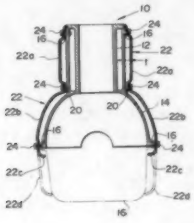
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Dec. 23, 1980, Ser. No. 220,184

Claims priority, application Japan, Dec. 25, 1979, 54-180108[U]

Int. Cl.³ F02B 77/00

U.S. Cl. 123—198 E 7 Claims



1. A low-noise level internal combustion engine having a cylinder block with opposed side portions, comprising:

an endless ridge extending along the entire peripheral portion of each of the side portions said ridge extending continuously along the entire upper, lower and side regions of each side portion to enclose a major portion of each side portion; and

a soundproof board mounted for sealingly contacting the entire surface of said ridge in a manner to cover at least the major portion enclosed by said ridge, said soundproof board, major portion and ridge defining a sealed air space (t) between the outer surface of said major portion and the inner surface of said soundproof board, said soundproof board being constructed of a material having high vibration damping effect.

4,412,517

IDLING SPEED CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

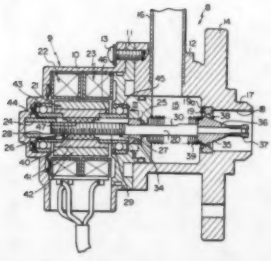
Mamoru Kobashi, Aichi; Shinichiro Tanaka, Toyota, and Hideo Saji, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Apr. 21, 1981, Ser. No. 256,188

Claims priority, application Japan, Oct. 6, 1980, 55-141493; Oct. 6, 1980, 55-141494

Int. Cl.³ F02M 3/00

U.S. Cl. 123—339 13 Claims



1. An idling speed control device for an internal combustion engine having an intake passage for delivering combustion air to the engine, a throttle valve arranged in the intake passage, a bypass passage having a first end connected to the intake passage upstream of the throttle valve and a second end connected to the intake passage downstream of the throttle valve, a valve member arranged in the bypass passage, a valve shaft connected to the valve member, and drive means for axially moving the valve shaft for controlling the flow area of the bypass passage in response to at least one engine operating condition, wherein said drive means comprises:

a step motor comprising a motor housing, a stator fixed in said motor housing, a rotor rotatably mounted in said motor housing, the rotor having an internally threaded bore coaxial with its axis of rotation and matingly engaging an externally threaded portion of said valve shaft, the motor housing having a bearing receiving hole; and bearing means having an outwardly projecting arm engaging an inner wall of said bearing receiving hole having a contour shape the same as that of the bearing for fixedly mounting the bearing means in said motor housing, said bearing means having a bearing hole of non-circular cross section and said valve shaft having a portion of complementary non-circular cross-section slidably received in said bearing hole, whereby rotation of said rotor is converted to linear motion of said valve shaft.

4,412,518

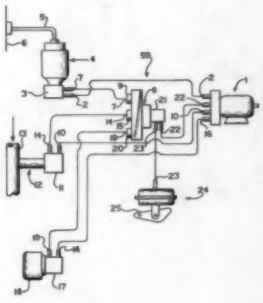
IDLE SPEED CONTROL SYSTEM

Andrew A. Kenny, Roselle, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 18, 1981, Ser. No. 322,806

Int. Cl.³ F02B 77/00

U.S. Cl. 123—339 19 Claims



1. A fluid pressure control system for maintaining a desired idling speed of an internal combustion engine comprising;

fluid pressure supply means,

idle speed fluid pressure actuator means, said means adapted to maintain the desired engine idling speed by movement of a force member thereof in response to a fluid pressure control signal received thereby,

engine speed sensing means, said means adapted to monitor the rotational speed of the engine and having means associated therewith for converting changes in the engine rotational speed into an output signal proportional to the engine rotational speed that is conveyed to a fluid pressure regulation means that is connected to the fluid pressure supply means and adapted to regulate the fluid pressure supply conveyed thereto to provide a first fluid pressure signal,

at least one fluid pressure signal in addition to said first fluid pressure signal, said pressure signal provided by at least one engine operating condition other than the rotational speed thereof that is desired for use in maintaining the idling speed of the engine having means associated therewith for converting said change into an output signal proportional to the condition monitored that is conveyed to a fluid pressure regulation means that is connected to the fluid pressure supply means and has means associated

therewith for providing said additional fluid pressure signal;

integration means, said means adapted to receive said first and said at least one additional fluid pressure signal and having means associated therewith for combining said signals in the manner desired into a single integrated output signal that is conveyed to a fluid pressure regulation means connected to the fluid pressure supply means and to the idle speed fluid pressure actuator means and has means associated therewith for utilizing said signal to regulate the fluid pressure supply conveyed thereto to provide the fluid pressure control signal for controlling the idle speed fluid pressure actuator means, and

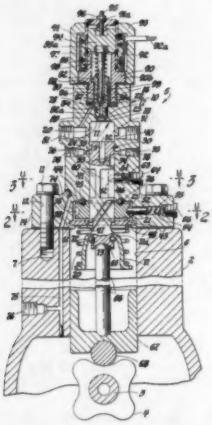
at least one of said engine speed sensing means, said additional engine operating condition sensing means, said fluid pressure regulation means, said integration means, and said actuator means calibratable such that the fluid pressure control signal is able to maintain the desired engine idling speed in response to a change in the rotational speed of the engine.

4,412,519

DIESEL FUEL DISTRIBUTOR TYPE INJECTION PUMP

Martin M. Hoch, Rochester, and Donald Stoltman, Henrietta, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 13, 1982, Ser. No. 417,385
Int. Cl.³ F02M *41/00*
U.S. Cl. 123—449 **4 Claims**



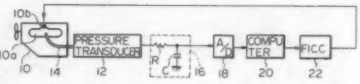
1. A fuel injection pump for the sequential delivery of fuel to the cylinders of an internal combustion engine, said pump including a housing means defining a pump cylinder with a plurality of circumferentially spaced apart discharge passages extending therefrom, the number of said discharge passages corresponding in number to the number of engine cylinders, and a fuel inlet passage to said pump cylinder axially spaced apart from said discharge passages; a pump plunger reciprocally received in the pump cylinder to define therewith a pump chamber with the inlet passage being uncovered by the plunger during the suction stroke thereof and being covered by the plunger during the pumping stroke thereof; a discharge means including a discharge slot on said plunger for effecting flow communication between the pump chamber and one of said discharge passages; drive means including a driven means operatively associated with the opposite end of the plunger to effect reciprocation thereof in timed relationship to engine operation; a pawl and ratchet means including an indexing means operatively associated with said plunger whereby during a pump stroke of said plunger, said pawl and ratchet means is operative to prevent rotation of said plunger and whereby, during a suction stroke of said plunger, said plunger will be rotatably indexed so that said discharge slot of said plunger is moved into registration with the next in line said discharge passage; and, a solenoid valve controlled spill passage means in flow communication with said pump chamber for the controlled spill flow of fuel from said pump chamber during a pump stroke of said plunger whereby to control the start and end of fuel injection.

4,412,520

FUEL INJECTION CONTROL APPARATUS

Masaki Mitsuyasu; Keiji Aoki, and Takayoshi Nakatomi, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 28, 1981, Ser. No. 287,806
Claims priority, application Japan, Jul. 30, 1980, 55-106872[U]
Int. Cl.³ F02B *3/00*; F02M *7/00*
U.S. Cl. 123—488 **4 Claims**



1. Fuel injection control apparatus for an internal combustion engine having an intake manifold, comprising:

a pressure transducer for converting the pneumatic pressure in the intake manifold to an electrical signal;

a low-pass filter electrically connected to said pressure transducer in series for transmitting said electrical signal below a cutoff frequency which is determined to be a frequency equal to or lower than 40 Hz;

an analog to digital converter means connected to said low-pass filter in series for converting the output signal from the low-pass filter to a binary number signal;

means for calculating the pulse width of fuel injection signals in response to said binary number signal from said analog to digital converter means, said pulse width corresponding to the fuel requirements of the engine during steady state and transient operating condition; and

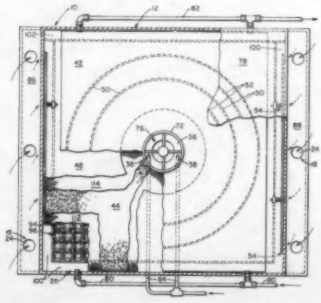
means for adjusting the amount of fuel injected into the engine in response to said fuel injection signals.

4,412,521

EVAPORATIVE CARBURETOR AND ENGINE

John C. Silva, Jr., 11 Colonial Rd., Ipswich, Mass. 01938

Filed Jul. 10, 1981, Ser. No. 282,226
Int. Cl.³ F02M *31/00, 13/04*
U.S. Cl. 123—522 **17 Claims**



1. Evaporative carburetor apparatus comprising

A. means forming a normally pressure-tight carburetor chamber having an outlet port for communication with an internal-combustion engine intake manifold,

B. normally horizontal evaporator tray means mounted within said chamber for containing a selected level of liquid gasoline,

C. a first valved air inlet for admitting air to the interior of said chamber, said inlet being normally closed and opening automatically in response to the difference in pressure between ambient and a lower pressure in the chamber interior,

D. means providing a first air passage within said chamber between said first inlet and a level in said tray means below said selected level, so that air drawn into said first inlet and said first passage to said outlet port passes through liquid gasoline in said tray means,

E. means providing a second air passage within said chamber in series with said first passage and communicating between said tray means and said outlet port,

F. means for heating fluid passing in said second passage from said tray means to said outlet port, and

G. a second valved air inlet for admitting air to said chamber along said second passage, said second inlet being externally operable between a substantially airtight closed position and an air passing open position.

4,412,522

MAGNET IGNITION DEVICE

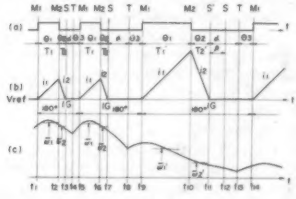
Takanori Fujimoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 178,440, Aug. 16, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,221

Claims priority, application Japan, Aug. 27, 1979, 54-109497; Aug. 27, 1979, 54-109498

Int. Cl.³ F02P 3/12

U.S. Cl. 123—602 **3 Claims**



1. A magnet ignition device comprising a power source which produces positive and negative output signals in synchronism with rotation of an engine, rectifies the output signals, and applies the rectified signals into an ignition coil;

a switching element for controlling the current passage of said ignition coil;

a first angular position detecting device for producing in synchronism with the rotation of said engine a first angular signal corresponding to a given crank angle position of said engine;

a second angular position detecting device for producing in synchronism with the rotation of said engine a second angular signal supplied directly to said switching element, which second angular signal corresponds to a crank angular position delayed by a given angle relative with respect to said given angular position where said first angular signal is produced and said second angular signal has a wider angular width than that of said first angular signal;

an ignition timing operation circuit which starts its operation by establishing a reference position in response to the occurrence of said first angular signal to compute an ignition timing in accordance with a running condition of the engine regardless of the amplitude and shape of said first angular signal; and

a control circuit for bypassing said second angular signal by a signal obtained by the operation result of said ignition timing operation.

4,412,523

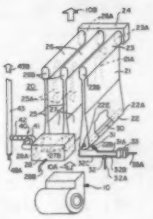
CATALYTIC GAS-FIRED FURNACE SYSTEM AND METHOD

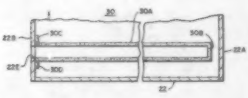
Richard J. Schreiber; John P. Kesselring, both of Mountain View, and Robert M. Kendall, Sunnyvale, all of Calif. assignors to Alzeta Corporation, Mountain View, Calif.

Division of Ser. No. 177,368, Aug. 11, 1980, Pat. No. 4,318,392. This application Oct. 5, 1981, Ser. No. 308,514

Int. Cl.³ F24C 3/04

U.S. Cl. 126—92 C **3 Claims**





1. In a method of operating a gas-fired furnace system, the steps of:

mixing gas and air components to produce a reactant fuel mixture having a percentage of excess air preselected to be equal to or greater than ten percent;

burning said reactant fuel mixture across the surface of a fiber matrix burner element contained in a substantially closed combustion chamber disposed in a stream of air to be heated to produce combustion products containing an emission level of nitrogen oxides substantially less than fifteen parts per million on an air-free basis, with CO and HC emissions substantially comparable to those in existing furnaces;

passing said combustion products through a heat exchanger disposed in said stream of air to be heated and having a wall surface area of a magnitude sufficient to produce substantial condensation of moisture in said combustion products and to produce an overall system thermal efficiency of at least about ninety percent; and

venting residual combustion products from said heat exchanger to the outside atmosphere.

4,412,524

FIRE-GUARD

John B. Ratelband, Utrechtsestraat 55-34, Rynstateflat, 6811 LV Arnhem, Netherlands

Continuation-in-part of Ser. No. 105,566, Dec. 20, 1979, Pat. No. 4,304,216, which is a continuation-in-part of Ser. No. 86,768, Oct. 22, 1979, abandoned. This application Sep. 21, 1981, Ser. No. 303,844

Claims priority, application Netherlands, May 14, 1979, 7903778

Int. Cl.³ F24B 7/00

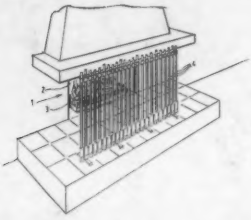
U.S. Cl. 126—121 **5 Claims**

1. A fire-guard for the conversion of radiation heat into convection heat adapted to be placed in front of a source of

radiant energy located in a room to be heated by the source, the fire-guard comprising:

a plurality of adjacent upwardly extending pipes, each of said pipes having an inlet opening and an outlet opening;

a plurality of pieces of tubing, each of said pipes being joined to one of said pieces of tubing, each of said pieces of tubing having at least one inlet opening in communication with said inlet opening of one of said pipes; and



hinge means interconnecting pairs of said adjacent pipes to secure said adjacent pipes together so that each of said pipes is pivotable about a vertical axis, said hinge means including overlapping eyes having coaxial vertical holes, said overlapping eyes being formed using adjacent pieces of tubing, said hinge means further including at least one removable vertical pivoting pin extending through eye holes of two adjacent pieces of tubing.

4,412,525

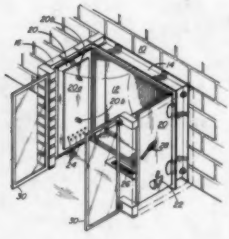
HIGH EFFICIENCY FIREPLACE MODIFICATION

Harold Aidla, 4027-75 St., Edmonton, Alberta, Canada T6K 0X2

Filed Jun. 10, 1981, Ser. No. 272,174

Int. Cl.³ F24B *11/00*

U.S. Cl. 126—140 **1 Claim**



1. Apparatus for improving the function of a fireplace having a front wall and an opening therein, comprising a unitary box-like extension comprising a pair of side walls and a top wall and bottom, said extension extending forwardly of said front wall of said fireplace and having its rear edges sealed with the front wall of said fireplace to surround the opening therein, a first set of impervious doors with said extension, hinged to the walls of said extension adjacent the opening of said fireplace and adapted to close the same, a second set of impervious doors spaced forwardly of said first set of doors to close said extension; a fresh air duct means opening into said extension between said first and second sets of doors; and variable damper means in said first set of doors to permit flow of air from said fresh air duct through said first set of doors into said opening.

4,412,526

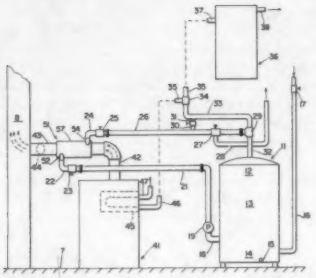
WATER TEMPERING SYSTEM

Louis DeGrose, 154 Elizabeth St., Pittston, Pa. 18640

Filed Jan. 16, 1981, Ser. No. 225,034

Int. Cl.³ F24H *9/12*

U.S. Cl. 126—365 **7 Claims**



1. A water heating apparatus for recovering energy from exhaust gases flowing through an exhaust duct connected to a source of heat, said water heating system comprises:

a heat exchange means mounted to receive the exhaust gases and containing fluid passage means extending therethrough for conveying water through said heat exchange means so that the water is heated by the exhaust gases;

a storage tank for storing tempered water from said heat exchange means;

a first conduit means for conveying water from said storage tank to said heat exchange means; and

a second conduit means for conveying heated water from said heat exchange means to said storage tank, said second conduit means includes an outlet tube for conveying tempered water out of the water heating apparatus, wherein said second conduit means comprises:

a discharge pipe section connected to an outlet of said heat exchange means, said discharge pipe is slightly inclined with respect to a horizontal plane for encouraging uniform flow of heated water therethrough;

an outlet duct connected to said discharge pipe section in which one end portion of said outlet duct is connected to the upper portion of said storage tank and the other end portion of said outlet duct is connected to said outlet tube of the water heating apparatus; and

a bypass pipe section connected to said discharge pipe and said outlet tube of the water heating apparatus for conveying heated water directly from said heat exchange means to the outlet of the water heating apparatus without mixing with the wter in said outlet duct.

4,412,527

GREENHOUSE OF AN UNDERGROUND HEAT ACCUMULATION SYSTEM

Kunio Fujie, Tokyo; Akinari Uchida, Ibaraki, and Kazuhiko Abe, Urawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1981, Ser. No. 251,544

Claims priority, application Japan, Apr. 9, 1980, 55-45594

Int. Cl.³ F24H *7/00;* **F24J** *3/02*

U.S. Cl. 126—400 **14 Claims**

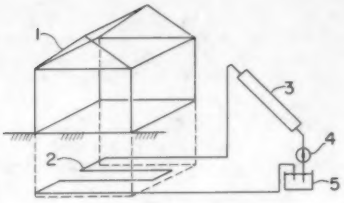
1. A greenhouse having an underground heat accumulation system comprising a main body having heat from a heat source accumulated underground below a floor thereof for use in heating an interior of the greenhouse, comprising:

an underground radiator located at a predetermined depth below the floor of the greenhouse, said underground radiator cooperation with soil in a vicinity thereof to constitute an underground heat accumulating section;

a solar heat collector for collecting radiant energy from the sun, said solar heat collector being thermally connected to said underground radiator of said underground heat accumulating section;

a fluid heated by the radiant energy collected by said solar collector, said fluid being circulated through the underground radiator of the underground heat accumulating section; and

wherein the predetermined depth of the underground radiator is determined by the relationship:



$$x = t/C$$

where:

x=predetermined depth of the underground radiator,

t=a time period, in months, from a moment at which an accumulation of solar heat has begun until a moment at which the solar heat is used in the greenhouse, and

C=a constant determined in accordance with a physical property of the soil under the floor of the greenhouse;

whereby the solar energy is accumulated in the underground heat accumulating section and utilized as a heat source in the greenhouse after an elapse of the time t.

4,412,528

HEAT STORAGE WINDOW

Eugene R. Elzinga, Jr., Warren, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 139,290, Apr. 11, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,721

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—417 **5 Claims**

1. A window comprising: a light transmissive planar window panel and a heat storage means, said planar window having four edges, said heat storage means disposed on one edge of said planar window panel, the remaining edges of said planar window panel having light reflective material on the surface thereof, said planar window panel including fluorescent material for absorbing a portion of solar radiation incident on said window and re-emitting the absorbed radiation at a different wavelength in random directions whereby the re-emitted radiation will be trapped by the phenomenon of total internal reflection and transmitted through the panel toward said heat storage means whereby the radiation directed toward said heat storage means is stored therein for subsequent use and whereby the solar radiation incident on said window which is not absorbed by said fluorescent material is transmitted through the panel.

4,412,529

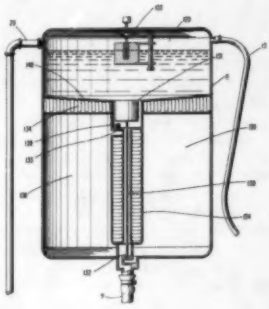
CLOSED LOOP SOLAR COLLECTOR SYSTEM WITH DUAL RESERVOIRS AND FLUID BYPASS

Barry W. Johnston, 1622 Que St., NW., Washington, D.C. 20009

Division of Ser. No. 146,424, May 5, 1980, Pat. No. 4,354,483, which is a continuation-in-part of Ser. No. 43,799, May 30, 1979, Pat. No. 4,286,579. This application Apr. 13, 1982, Ser. No. 368,084

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—419 **4 Claims**



1. A closed loop solar collector system comprising:

a fluid receiver for collecting solar heat;

fluid supply means, connected to said fluid receiver, for supplying a quantity of vaporizable heat transfer fluid to said fluid receiver;

means, attached to said receiver, for precisely metering a quantity of heat transfer fluid into said receiver from said supply means;

valve means connected to said fluid receiver for controlling fluid flow from said fluid receiver, said valve means being responsive to the pressure of the vaporized heat transfer fluid from said fluid receiver and to the pressure of condensed heat transfer fluid in said fluid supply means;

heat exchanger means connected to said valve means for receiving said heat transfer fluid and for absorbing heat energy from said heat transfer fluid which is vaporized in said receiver, said vaporized heat transfer fluid condensing after releasing its latent heat of vaporization to said heat exchanger, said condensed fluid flowing out of said heat exchanger under pressure provided by said vaporized fluid entering said heat exchanger means;

first reservoir means connected to said heat exchanger for receiving said heat transfer fluid which flows out of said heat exchanger;

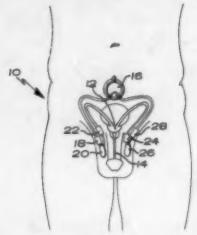
second reservoir means connected to said first reservoir means for receiving heat transfer fluid flowing out of said first reservoir means, said second reservoir means additionally connected to said fluid supply means and to said fluid receiver for receiving heat transfer fluid from said receiver and returning said heat transfer fluid to said fluid supply means;

said valve means causing fluid to flow to the second reservoir, bypassing the first reservoir, when pressure of condensed fluid falls below a predetermined level.

4,412,530
DUAL-MODE VALVE PRESSURE REGULATING SYSTEM

John H. Burton, Minnetonka, Minn., assignor to American Medical Systems, Inc., St. Louis Park, Minn.

Filed Sep. 21, 1981, Ser. No. 303,992
Int. Cl.[3] A61F 1/00; A61B 17/00
U.S. Cl. 128—1 R 9 Claims



1. A dual-mode valve pressure regulating system in a prosthetic sphincter for controlling incontinence of the type comprising a fluid reservoir, an inflatable cuff for selective occlusion of a vessel, means for pumping fluid to said reservoir from said cuff and means for controlling flow from said pump means to said reservoir connected in fluid flow relationship, the improvement in said flow controlling means comprising:

cracking valve means allowing flow from said cuff to said reservoir only upon attainment of a first predetermined pressure in said cuff, said first predetermined pressure being low enough to prevent physiological damage;

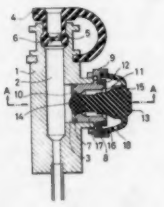
holding valve means allowing flow from said cuff to said reservoir only upon attainment of a second predetermined pressure in said cuff, said first predetermined pressure being greater than said second predetermined pressure and said second predetermined pressure is at least that required to maintain continence; and

flow resistor means in series with said holding valve means.

4,412,531
SUCTION DEVICE FOR ENDOSCOPE

Kiyoshi Chikashige, Kawagoe, Japan, assignor to Kabushiki Kaisha Medos Kenkyusho, Kawagoe, Japan

Filed Oct. 6, 1980, Ser. No. 194,701
Claims priority, application Japan, Oct. 6, 1979, 54-138814[U]
Int. Cl.[3] A61B 1/00
U.S. Cl. 128—4 10 Claims



1. A suction device for an endoscope, the endoscope having a forceps receiver which has a closable forceps insertion bore therein, comprising:

means for forming a suction path extending from said forceps insetion bore; and

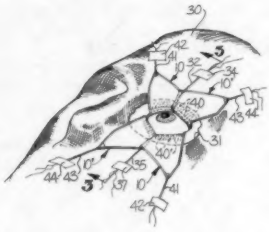
a plug assembly detachably inserted in said suction path in close contact with said suction path forming means, said plug assembly comprising: a ring, a piston, at least one portion of which is made of a deformable material; and a cylinder member into which said piston is slidably fitted, said cylinder member having valve seats formed at first and second portions thereof, said piston having first and second abutting portions for alternatively engaging said first and second valve seats, wherein abutment with the first valve seat allows passage of ambient air into said bore and wherein abutment with the second valve seat allows for suction in said bore said piston further having an elastic extended member extending outwardly away from said forceps insertion bore from said portion made of said elastic material, said extended member having an end portion abutting against said ring, said extended member biasing said piston so that said piston tends to move outwardly away from said forceps insertion bore, said cylinder member being provided with a suction hole; and

a suction pump coupled to said suction hole.

4,412,532
EYELASH RETRACTOR

Richard R. Anthony, 304 West Union St., Morganton, N.C. 28655

Filed Dec. 21, 1981, Ser. No. 332,617
Int. Cl.[3] A61B 17/02
U.S. Cl. 128—20 7 Claims



1. An eyelash retractor for covering and shielding the eyelashes and adjacent portion of the eyelid during the examination of and/or surgery on the eyeball of a patient, said eyelash retractor comprising two separate body members of thin film material including inner and outer edges and opposed sides, a hooked portion extending along the full length of said inner edge of each of said body members and including a lip extending substantially parallel to and spaced from an adjacent portion of said body member, said lip of each of said body members being adapted to extend beneath substantially one-half of the full width of the eyelid of the patient with the portion of said body member adjacent said hooked portion covering and shielding the eyelashes and substantially one-half of the full width of the adjacent portion of the eyelid, each of said body members including inner free edges adapted to mate in abutting or overlapping relationship when said eyelash retractor is in position on the eyelid to substantially completely cover and shield the full width of the adjacent portion of the eyelid, to maintain the eyelashes out of the area of the eyeball, and to provide a clear and unobstructed field for examination of and/or surgery on the eyeball.

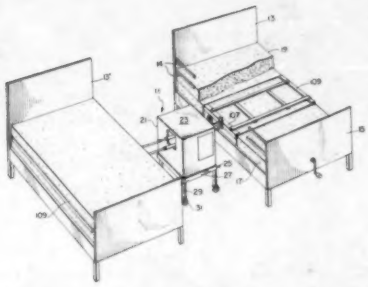
4,412,533
SLEEP-INDUCING DEVICE

Doris S. Callahan, 2712 Thomas, Fort Worth, Tex. 76117

Filed Dec. 31, 1981, Ser. No. 336,100
Int. Cl.[3] A61H 1/00
U.S. Cl. 128—33 9 Claims

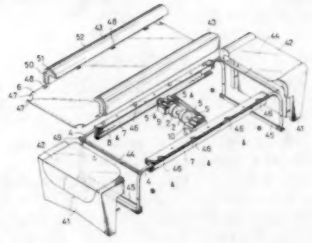
1. A sleep-inducing device for attachment to more than one bed of the type having a frame, a spring assembly supported by the frame and a mattress supported on the spring assembly, the device comprising:

a base member;
a motor mounted on said base member;
means for connecting said base member to more than one bed frame;
a plurality of rotatable disks;
means for driveably and adjustably coupling said motor to each of said crank disks;
said crank disks each having a link arm connecting each of said disks to a different spring assembly;
each link arm being arranged to oscillate said spring assembly in response to the rotation of said crank disk; and



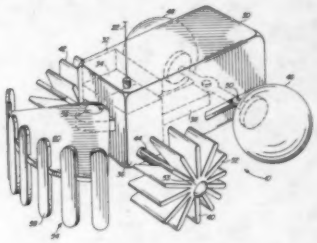
means for independently varying the degree of oscillation imparted to each spring assembly to which said device is attached, wherein said varying means comprises a guide channel in each of said disks and a lockable sliding pin member arranged to slide in said guide channel when in an unlocked condition, means for rotatably connecting said link arm to said pin member and means for locking each sliding member at any selective position along said guide channel, whereby said link arm is rotatably connected to said sliding member when in a locked condition.

4,412,534
MASSAGING APPARATUS
Takafumi Hamabe, and Hiroshi Moriwaki, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Apr. 24, 1981, Ser. No. 257,003
Claims priority, application Japan, Jun. 6, 1980, 55-77003
Int. Cl.³ A61H *7/00*
U.S. Cl. 128—52 **9 Claims**



7. A massaging apparatus comprising a motor, a rotary shaft axially rotated by the output of said motor, massaging wheels fitted to said rotary shaft and a shifting shaft for shifting the rotary shaft in directions perpendicular to the axial direction of the rotary shaft with the output of the motor, wherein said motor is connected to said rotary shaft and shifting shaft through a gearing including a planetary mechanism, said gearing comprises an input shaft receiving the input of said motor and secured to a sun part in the form of an inner race of said planetary mechanism, a first output shaft connected between a planetary carrier of said planetary mechanism and either one of the rotary shaft and shifting shaft and a second output shaft connected between a rotary ring in the form of an outer race of the planetary mechanism and the remainder of the shifting shaft and rotary shaft, a plurality of antifriction members are arranged between said inner and outer races, said planetary carrier is formed of a retainer for regulating the operation of said antifriction members, and precompressed springs bias either one of said inner and outer races in a thrusting direction.

4,412,535
REMOTELY CONTROLLED MASSAGING APPARATUS
Dorothy R. Teren, 7795 N. Pines View Dr., Scottsdale, Ariz. 85258
Filed Aug. 17, 1981, Ser. No. 293,135
Int. Cl.³ A61H *15/00*
U.S. Cl. 128—57 **6 Claims**

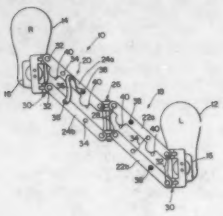


1. A self-massaging apparatus for massaging one's back, said apparatus comprising in combination:
(a) a self-propelled vehicular unit;
(b) drive means for propelling said vehicular unit across one's back, said drive means including wheels having angularly displaced radially oriented flexible plates for imparting a varied pressure massaging action to the surface of the back traversed
(c) selectively actuatable means for steering said vehicular unit right or left; and
(d) a control unit for directing the forward/backward movement and left/right movement of said vehicular unit across one's back, said control unit including a remotely located transmitter for generating command signals relative to speed and direction of said vehicular unit and a receiver located at said vehicular unit for receiving the command signals and translating the command signals into signals for actuating said drive means and said steering means.

4,412,536
ORTHOPEDIC FOOT SPLINT
Robert J. Kurtz, New York, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch, Farmingdale, N.Y.
Filed Jan. 28, 1982, Ser. No. 343,555
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 A **8 Claims**

1. An orthopedic foot splint comprising:
a pair of shoe engaging plates for engaging shoes having longitudinal axis;
linkage means for interconnecting said pair of shoe engaging plates, said linkage means including two pairs of parallelogram links which are pivotable in a horizontal plane relative to each other and to the respective shoe engaging plate; and
a flexible nonextensible tether attached to opposed links of one of said pair of parallelogram links, said tether being

positioned at an angle across said one pair of parallelogram links when said links are extending perpendicular from the shoe such that said one pair of links are prevented from pivoting in the horizontal plane beyond a predetermined angle with respect to the longitudinal axis of the adjacent shoe but which can pivot in the opposite direction freely.



4,412,537

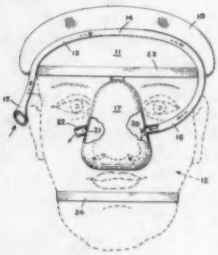
FRESH AIR BREATHING MASK WITH EXTERIOR HEAT EXCHANGER

Howard L. Tiger, Eagle Ridge Way, West Orange, N.J. 07052

Filed Jul. 27, 1981, Ser. No. 287,309

Int. Cl.³ A61M *15/00*

U.S. Cl. 128—204.17 **1 Claim**



1. A breathing mask for wear on the head comprising a tubular fresh air inlet, a heat exchanger in fluid communication with said fresh air inlet, said heat exchanger being sufficiently flexible to conform with the scalp and being generally thin in order to absorb heat from the scalp, a flexible tube in fluid communication with said heat exchanger, and a check valve for selectively interrupting said flexible tube fluid communication to establish air flow only from said heat exchanger through said flexible tube, a nose mask in fluid communication with said tube and said check valve, another check valve for establishing fluid communication with said mask, a discharge tube for providing fluid communication selectively from said mask and directly to the atmosphere through said another check valve, a cap for securing said heat exchanger to the head, and means for securing said mask to the head.

4,412,538

APPARATUS FOR REFRIGERATION TREATMENT

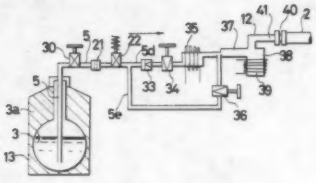
Toshima Yamauchi, Oita; Sadao Nogami, Beppu; Kengi Sawada, Oita; Jyunichiro Moriya, Kokubunji; Hiroomi Sawada, Ichikawa, and Keizou Kobayashi, Hanno, all of Japan, assignors to Kabushiki Kaisha Kurio-Medikaru, Tokyo, Japan

Division of Ser. No. 109,271, Jan. 3, 1980, Pat. No. 4,292,973, which is a division of Ser. No. 944,079, Sep. 20, 1978, abandoned. This application Jul. 31, 1981, Ser. No. 288,918

Claims priority, application Japan, Sep. 25, 1977, 52-114967; Feb. 28, 1978, 53-22900

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **3 Claims**



1. An apparatus for refrigeration treatment comprising a liquefied gas source, an evaporator for evaporating the liquefied gas at an optimum temperature, an exhaust tube connected between said gas source and said evaporator to conduct the liquefied gas from said gas source to said evaporator, a conduit for introducing the gas vaporized by said evaporator and being connected to said evaporator by means of an outflow port, and a cup provided with a non-return expansion valve attached at the end of said conduit, said cup adapted to apply said vaporized gas to an affected portion of a patient in order to refrigerate said portion with said vaporized gas, said evaporator being provided with an evaporator chamber in which said liquid is accomodated and then evaporated by heat conduction from the wall surface thereof for evaporating the liquefied gas to a gaseous state to be blown out from the cup at a specified temperature and wherein said evaporator is provided with a first flow path having the evaporating chamber therein and a second flow path, said apparatus further comprising a mixing cylinder at the outlets of said evaporating chamber and said second flow path, the liquid and gas flowing through the respective paths being mixed in a spray in said mixing cylinder, and said exhaust tube comprises a valve for preventing the inflow of liquefied gas into said evaporating chamber when the liquid of the liquefied gas fed to said evaporating chamber reaches a specified flow rate.

4,412,539

REPEATING HEMOSTATIC CLIP APPLYING INSTRUMENTS AND MULTI-CLIP CARTRIDGES THEREFOR

Robert K. Jarvik, Salt Lake City, Utah, assignor to United States Surgical Corporation, Stamford, Conn.

Continuation of Ser. No. 71,033, Aug. 30, 1979, abandoned, which is a continuation of Ser. No. 730,933, Oct. 8, 1976, Pat. No. 4,166,466. This application May 11, 1981, Ser. No. 262,759

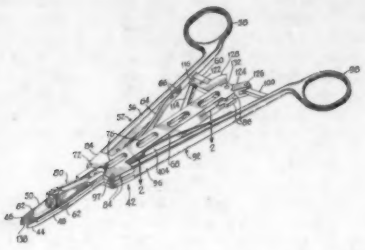
Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **5 Claims**

4. In a hemostatic clip applying instrument having a pair of jaws for applying hemostatic clips, a pair of closable handle shafts operated in a manner similar to the handle shafts of a conventional hemostat, a channel member having a channel for hemostatic clips leading to the jaws and a pusher for advancing a clip down said channel toward said jaws; a reciprocating mechanism operated by closing the handle shafts for reciprocating the pusher along the center line thereof, comprising:

pivotal means for effecting a pivotal connection to the end of said pusher remote from said jaws; anmd

a bell crank rotatable about an axis fixed with respect to said channel for at least a portion of the rotatable movement of said bell crank, and having one leg pivotally connected to



said pivotal means, and another leg being associated with one of said handle shafts so that said bell crank can be rotatably actuated thereby.

4,412,540

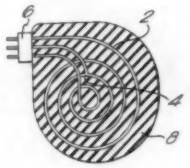
METHOD FOR HIGH FREQUENCY ELECTROMAGNETIC THERAPY

Richard H. C. Bentall, P.O. Box 47, London, W11, England

Division of Ser. No. 205,749, Nov. 10, 1980, which is a division of Ser. No. 74,926, Sep. 13, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 429,982

Int. Cl.³ A61N *1/40*

U.S. Cl. 128—422 **4 Claims**



1. A method for promoting healing of body tissue, comprising the steps of:

generating a high frequency, low-energy electromagnetic field at a treatment frequency determined by an inductive-capacitive tuned circuit;

radiating the electromagnetic field from a flexible inductor-antenna into an area of body tissue to be treated, at a field strength which promotes healing of body tissue, but which is too small to significantly heat body tissue; and,

controlling the frequency of the field by including the inductor-antenna as a part of the tuned circuit, whereby the strength of the radiated field is independent of the differences in capacitive coupling between the inductor-antenna and the body tissue to be treated.

4,412,541

CARDIAC PACEMAKER

Max Schaldach, Königsmarckstr. 12, 1000 Berlin 33, Fed. Rep. of Germany, and J. Walter Keller, 8600 - SW. 54th Ave., Miami, Fla. 33143

Filed Apr. 12, 1982, Ser. No. 367,791

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3115124

Int. Cl.³ A61N *1/36*

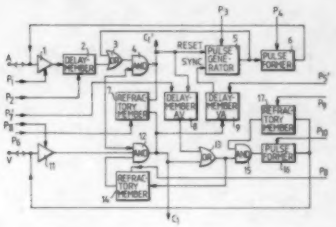
U.S. Cl. 128—419 PG **15 Claims**

1. A cardiac pacemaker constructed for terminating tachyarrhythmias and including an atrial electrode implantable in a patient's heart for supplying atrial stimulation pulses thereto and at which a pulse appears in response to each atrial contraction, and a ventricular electrode implantable in the patient's heart for supplying ventricular stimulation pulses thereto, and at which a pulse appears in response to each ventricular contraction, said pacemaker further comprising:

separately switchable means connected to each said to electrode for causing one said electrode to produce a stimulation pulse at a given time after the occurrence of a pulse on the other said electrode;

first time delay means connected to be actuated by signals derived from the heart behavior for supplying a stimulating pulse to said ventricular electrode at a time after the occurrence of a pulse on said atrial electrode, which is shorter than the physiological atrial-ventricular transfer time;

and second time delay means connected to be actuated by signals derived from the heart behavior for supplying a stimulating pulse to said atrial electrode at a time after the occurrence of a pulse on said ventricular electrode which is shorter than a selected physiological period in the operation of the heart.



4,412,542

ROBE GARMENT FOR MASTECTOMY PATIENT

D. Jeanie Reichert, E. 1415 - 18th Ave., Spokane, Wash. 99203

Filed Jul. 19, 1982, Ser. No. 399,199

Int. Cl.³ A41C *3/08, 1/06, 3/10*

U.S. Cl. 128—455 **9 Claims**

1. A robe garment for a mastectomy patient, comprising:

an inner garment panel having a closable front opening for circumscribing the upper torso of the patient;

said inner garment panel having an elongated lower tension member for circumscribing the patient's torso below the breastline;

said inner garment panel having a back panel section extending vertically from a rear garment neckline to the lower tension member and laterally across the back of the garment;

said inner garment panel having a pair of interconnectable breast cup members affixed to the lower tension member for receiving and supporting either natural breasts or breast prosthesis;

said inner garment panel having elongated shoulder straps

interconnecting the breast cup members and the back panel section for extending upward over the respective shoulders of the patient;

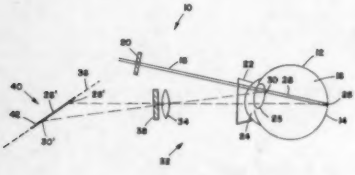
an elongated outer garment panel affixed to inner garment panel along the shoulder strap members and draped downward over the inner garment panel and of sufficient length to extend below the patient's waist and having a front opening to enable the patient to ingress and regress from the garment through the front opening when the breast cups are unconnected.

4,412,543

APPARATUS FOR DETERMINING THE CONCENTRATION OF A FLUORESCENT MATERIAL IN AN EYE

Arthur Vassiliadis, Palo Alto; Michael H. Brewer, Felton, and Robert E. Myers, Menlo Park, all of Calif., assignors to Xanar, Inc., Colorado Springs, Colo.

Filed Apr. 9, 1981, Ser. No. 248,881
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—633 **6 Claims**



1. An apparatus for determining the concentration of an administered fluorescent material at a plurality of locations in an eye which comprises:

(a) light source means for exciting the fluorescent material along a path length in the eye to emit fluorescence; and

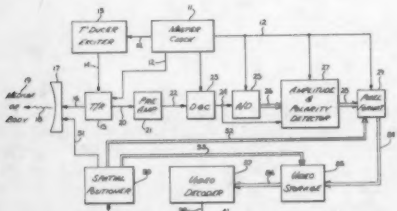
(b) means for imaging fluorescence responsive to said excitation simultaneously at a plurality of locations along said path length.

4,412,544

ULTRASONIC METHOD AND APPARATUS FOR IMAGING AND CHARACTERIZATION OF BODIES USING AMPLITUDE AND POLARITY DETECTION

Irwin Beretsky, New City, N.Y.; David E. Arnold, Bergenfield, N.J., and Bruno Pellegrini, Yonkers, N.Y., assignors to Chromasonics, Inc., New City, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,049
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **23 Claims**



1. An improvement in an apparatus for processing multiple cycle, ultrasonic pulse echo signals having amplitude and polarity in combination with a transceiver to send and receive ultrasound echoes comprising:

integrator means for accumulating said ultrasound echo signals for each half wave of said multicycle ultrasound pulse echo signals and for generating an integrated, absolute value, half-wave signal from said half-wave of said multicycle pulse echo signal; and

means for examining a plurality of said absolute value, half-wave signals and analyzing said plurality of half-wave signals to determine if a predetermined pattern indicative of a pulse echo among said plurality of half-wave signals is present, said means coupled to said integrator means,

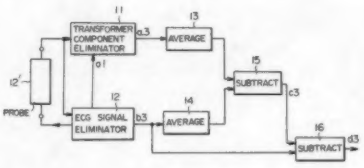
whereby individual echoes reflected from complex body media are detected without deconvolutional computation and without the use of specialized ultrasound transducers.

4,412,545

ELECTROMAGNETIC BLOOD FLOWMETER

Haruka Okino, Tokyo; Keitkitsu Ogawa, Tokorozawa; Sunao Takeda, Ichikawa; Hiromichi Mohri, Fujimi, and Shigeru Hiraide, Tokyo, all of Japan, assignors to Nihon Kohden Corporation, Tokyo, Japan

Filed Jun. 25, 1981, Ser. No. 277,115
Claims priority, application Japan, Jul. 2, 1980, 55-89177
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—691 **3 Claims**



1. An electromagnetic blood flowmeter comprising: means for exciting an excitor coil with alternating rectangular pulses to effect a magnetic field; a probe including the excitor coil for applying to the blood flow an alternative rectangular magnetic field with a non-excitation period interposed between each excitation period and detector electrodes for detecting the induced voltage corresponding to the velocity of the blood flow; ECG signal eliminator circuit means including sample-and-hold circuit means sampling induced voltage output signals of said detector electrodes at the end portion of one of a pair of adjacent non-excitation and excitation periods and holding said sampled signals, means for subtracting each of said sampled signals from each of said output signals for the directly succeeding other of the pair of excitation and non-excitation periods, synchronous detector circuit means detecting the sampled output signals of said subtracting means at a point spaced from the end portion of the succeeding one of excitation and non-excitation periods, and hold circuit means producing the envelope of output signals of said synchronous detector circuit means; transformer-component eliminator circuit means; transformer-component extracting means averagely subtracting output signals of said transformer-component eliminator circuit means from those of said ECG signal eliminator circuit means; and means for subtracting output signals of said transformer-component extracting means from those of said ECG signal eliminator circuit means; said transformer-component eliminator circuit means including means for generating a voltage corresponding to the transformer component V_{TM} of induced voltage output signal of said detector electrodes for each excitation period on the basis of the transformer component V_T of sampled induced voltage output signal of said detector electrodes for each non-excitation period in accordance with the relation $V_T = KV_{TM} + V_O$ (K: the constant of proportion, V_O: offset voltage), means for subtracting said voltage V_{TM} from the output signal of said probe directly before or after each excitation period, synchronous detector circuit means detecting the sampled output signals of said subtracting means for each excitation period and hold

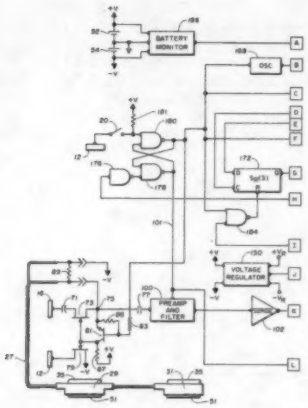
circuit means producing the envelope of output signals of said synchronous detector circuit means.

4,412,546

CARDIAC MONITORING APPARATUS

Richard N. Barthels, Mesa, Ariz., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 37,407, May 9, 1979, abandoned. This application Mar. 19, 1981, Ser. No. 245,559
Int. Cl.³ A61B 5/04
U.S. Cl. 128—709 7 Claims



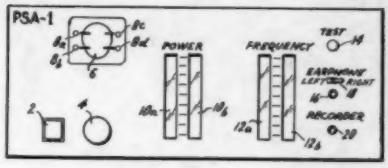
1. In an electrical cardiac monitoring system including signal processing means, enabling means for enabling said signal processing means, an input circuit path for coupling electrocardiac signals to said signal processing means, switch means coupled so as to change the state of said enabling means from a first state to a second state when said switching means is operated, a first electrode sensing means coupled to a user at a first point, a second electrode sensing means coupled to the user at a second point, power supply means coupled to supply the electrical energy through said user in a first current path between said first and said second points so as to generate a first electrocardiac signal wherein electrocardiac signals supplied along said input circuit path to said signal processing means are processed by said signal processing means only when said enabling means is in said second state, the improvement comprising: a third electrode sensing means coupled to the user at a third point, a fourth electrode sensing means coupled to the user at a fourth point wherein said power supply means is coupled to supply electrical energy in a second current path to said user between said third and fourth points so as to generate a second electrocardiac signal, control means and interconnecting means selectively coupled between said third and said fourth electrode sensing means and said control means wherein said control means is constructed to prevent said first electrocardiac signal being coupled through said first current path and to allow said second electrocardiac signal to be coupled through said input circuit path to said signal processing means when said interconnection means is coupled to said control means and said enabling means is in its second state and further wherein said first electrocardiac signal is coupled through said input circuit path to said signal processing means when said interconnecting means is not coupled to said control means.

4,412,547

NEUROLOGICAL MONITORING DEVICE

Alfred S. Callahan, Mobile, Ala.; James S. Rhodes, and Timothy L. Johnson, both of Wellesley, Mass., assignors to Neurologics, Inc., Nashville, Tenn.

Filed Apr. 29, 1981, Ser. No. 258,588
Int. Cl.³ A61B 5/04
U.S. Cl. 128—731 7 Claims



3. A brain wave analyzer adapted to receive brain wave signals from a patient undergoing an operation, analyze said brain wave signals, and provide brain wave frequency and amplitude information, said brain wave analyzer comprising:

filter means for receiving said brain wave signal and having a predetermined pass band, said filter means providing a filtered output;

detector means for receiving said filtered output for detecting the amplitude of said brain wave signal and for providing said brain wave amplitude information in accordance with said detected amplitude;

converter means for receiving said filtered output for detecting, over a frequency range greater than said predetermined pass band, the instantaneous frequency of said brain wave signals having amplitudes above a predetermined amplitude, and for providing said brain wave frequency information in accordance with said detected frequency, to thereby allow the frequency of said brain wave signal to be tracked over said frequency range greater than said pass band;

and linear amplitude and frequency displays for displaying said amplitude and frequency information.

4,412,548

MULTIPLE SAMPLE NEEDLE ASSEMBLY

Louis Hoch, Nutley, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Jul. 30, 1981, Ser. No. 288,640
Int. Cl.³ A61B 5/14
U.S. Cl. 128—764 8 Claims

1. A multiple sample needle assembly for determining vein entry when collecting blood samples from a patient comprising:

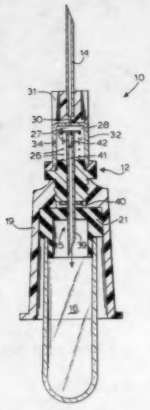
a housing having a forward end, a rearward end and a chamber within, said housing being translucent at least around the chamber so that said chamber is viewable by a user of said assembly;

a first cannula in fluid communication with said chamber extending outwardly from said forward end adapted for insertion into a patient;

a second cannula slidably positioned in said rearward end and having a first end portion extending outwardly from said rearward end and a second end portion extending inwardly into said chamber with an access opening extending through the wall of said second end portion and providing fluid communication between said second end portion and said chamber; and

a tightly wound coil spring inside said chamber surrounding the interior portion of said second cannula, said spring being sealingly affixed to the rearward end of said housing; a cap extending over and sealing the end of said spring opposite said end affixed to said rearward end of said

housing, said cap being connected to said second cannula, said tightly wound coils and said cap adapted to prevent blood in said chamber from entering into said access opening in the compressed position of said spring, said second cannula adapted to slide inwardly into said chamber under the influence of a force applied to said first end portion to thereby expand said spring and produce spaces between



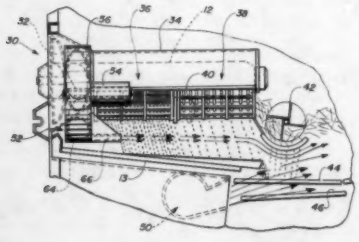
said coils so that blood in said chamber flows through said spaces into said access opening for collection through said second cannula, said spring adapted to become tightly compressed upon removal of said force, said compressing movement sliding said second cannula outwardly from said chamber, and said compressed spring preventing blood from flowing through said access opening.

4,412,549

COMBINE HARVESTER WITH IMPROVED CLEANING

E. William Rowland-Hill, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Oct. 29, 1981, Ser. No. 316,253
Int. Cl.³ A01F *12/48*
U.S. Cl. 130—27 T **6 Claims**



1. A harvester comprising:

rotary means in the harvester for threshing and separating crop material, said rotary means having an infeed portion;

means connected to the harvester for feeding crop material to the infeed portion;

a grain pan operably connected for receiving crop material from said rotary means and transporting the crop material received thereon, said grain pan being spaced below said rotary means;

means for cleaning grain moving from said rotary means to said grain pan, said means for cleaning including a first fan mounted in a housing, said housing including a plenum portion and a substantially flat, elongated spout for moving a substantially flat sheet of forced air between said rotary means and said grain pan, said first fan being operable to clean crop material before being received on said grain pan;

a sieve operably connected for receiving crop material from said grain pan, said sieve being spaced from said grain pan; and

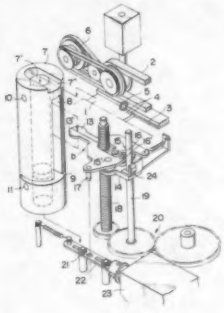
further means for cleaning grain moving from said grain pan to said sieve, said further means including a second fan for moving air between said transport means and said sieve.

4,412,550

COIN ACCUMULATOR ASSEMBLY

Kenkichi Watanabe, and Setsuo Hata, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed May 7, 1981, Ser. No. 261,573
Claims priority, application Japan, May 8, 1980, 55-61162
Int. Cl.³ G07D *9/06*
U.S. Cl. 133—8 A **4 Claims**



1. A coin accumulator assembly for use in a coin wrapping machine, comprising a coin accumulator tube, a shutter movably inserted into said coin accumulator tube for supporting coins stacked in the accumulator tube until a predetermined number of coins is accumulated and for opening to pass coins for a further treatment when said predetermined number of coins is accumulated in said coin accumulator tube, and means for stepwisely lowering said shutter, wherein said coin accumulator tube has a vertically-extending slit and a circumferential slit formed at the lower portion of the tube, and said shutter includes substantially symmetrical shutter plates each having a generally semicircular free end, an elongated stem portion and a generally trapezoidal base portion, said shutter plates being closed during the counting and accumulating operation with their free ends snugly received in the cavity of said coin accumulator tube to form the bottom of the tube and with their stem portion extending through said vertically-extending slit.

4,412,551

APPARATUS FOR CLEANING HYDRAULIC FLUID SYSTEM

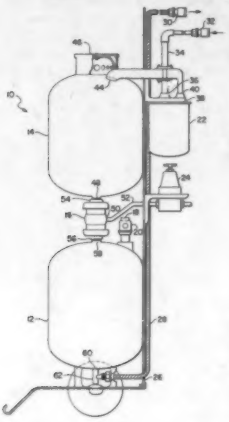
LeRoy W. Peters, 155 Canal St., #17, and Walter E. Moore, 647 Francisco Blvd., both of San Rafael, Calif. 94901

Filed Jan. 7, 1982, Ser. No. 337,562
Int. Cl.³ B08B *9/00*
U.S. Cl. 134—104 **6 Claims**

1. An apparatus for flushing solvent through a machine such as a hydraulic cooling system having a first fluid inlet and a first fluid outlet, said apparatus comprising:

a first reservoir for supplying solvent to said first fluid inlet, said first reservoir being pressurizable and having a second fluid inlet and a second fluid outlet, said second fluid outlet for coupling to said first fluid inlet;

a second reservoir for recovering solvent from said fluid outlet, said second reservoir having a third fluid inlet and a third fluid outlet; and



means having a fourth fluid inlet coupled to said third fluid outlet and a fourth fluid outlet coupled to said fluid inlet for communicating solvent from said second reservoir to said first reservoir and for pressurizing said first reservoir to propel solvent through said second fluid outlet.

4,412,552

METHOD OF CONTROLLING INLET VALVES OF COMPRESSION REACTOR AND DEVICE FOR EFFECTING SAME

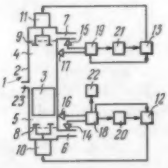
July A. Kolbanovsky, Moscow; Romeo V. Tsagareli, Tbilisi, and Viktor S. Schipachev, Moscow, all of U.S.S.R., assignors to Institut Neftekhimicheskogo Sinteza Imeni A.V. Topchieva Akademii Nauk SSSR, U.S.S.R.

PCT No. PCT/SU80/00076, § 371 Date Dec. 24, 1981, § 102(e) Date Dec. 24, 1981, PCT Pub. No. WO81/03130, PCT Pub. Date Nov. 12, 1981

PCT Filed May 5, 1980, Ser. No. 336,372

Int. Cl.³ B01J *3/00*

U.S. Cl. 137—14 **4 Claims**



1. A method of controlling inlet valves of a compression reactor by way of opening and closing the inlet valves which open towards the inside of the compression reactor, characterized in that in the process of operation of the compression reactor **1** the sign of a pressure differential (ΔP) between a working space **4, 5** of the reactor **1** and a respective supply line **7, 6** is determined, at the instant the sign of the pressure differential (ΔP) changes from "minus" to "plus" a command to relieve the inlet valves **8, 9** of all control actions keeping the inlet valves **8, 9** in a closed state is produced, and at the instant the sign of the pressure differential (ΔP) changes from "plus" to "minus" a command to read a preset time interval (τ) within which the inlet valves **8, 9** are open is produced, at the expiration of the preset time interval (τ) a command to close the inlet valves **8, 9** of the compression reactor **1** and to keep them in a closed state is supplied.

4,412,553

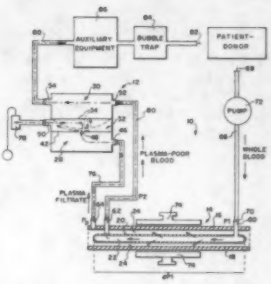
DEVICE TO CONTROL THE TRANSMEMBRANE PRESSURE IN A PLASMAPHERESIS SYSTEM

Clinton V. Kopp, and James Hitchcock, both of Barrington, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 25, 1981, Ser. No. 277,449

Int. Cl.³ B01D *31/00*

U.S. Cl. 137—118 **5 Claims**



1. A device for controlling the transmembrane pressure of a membrane which filters plasma from whole blood in a plasmapheresis system which includes a fluid line for conducting plasma-poor blood from the membrane to the donor and another fluid line for simultaneously conducting plasma filtrate from the membrane for collection, said device comprising:

an upper member and a lower member which are peripherally sealed together to collectively form a housing having an interior area,

a generally flexible first interior wall and a second interior wall, said walls being peripherally sealed between the peripheries of said upper and lower members and positioned one atop the other within said interior area to compartmentalize said interior area into a first chamber, which extends between said upper member and said flexible first wall; a second chamber, which extends between said lower member and said second wall; and an interior fluid path, which extends between said flexible first wall and said second wall,

first and second tubular members sealingly engaged between the peripheries of said upper member and said flexible first wall at diagonally opposite sides of said housing and extending from said first chamber outwardly of said housing along generally parallel and coplanar axes, said first and second tubular members communicating with the plasma-poor blood line for directing the plasma-poor blood in a uniform, laminar path across said first chamber,

a third tubular member sealingly engaged between the peripheries of said lower member and said second wall and extending from said second chamber outwardly of said same housing side as said first tubular member along an axis which is generally parallel to the axis of said first tubular member, said third tubular member communicating with the plasma filtrate line for directing plasma filtrate into said second chamber,

means defining an opening in said second wall essentially in the mid-portion thereof for directing the plasma filtrate from said second chamber into said interior fluid path,

a fourth tubular member diagonally oppositely spaced from said third tubular member, said fourth tubular member being sealingly engaged between the peripheries of said first and second interior walls and extending from said interior fluid path outwardly of said housing along an axis which is generally parallel to the axis of said second tubu-

lar member, said fourth tubular member communicating with the plasma filtrate line for directing plasma filtrate out of said interior fluid path for collection, and

said generally flexible first wall being operative for relative movement toward and away from said second wall opening to variably restrict the flow of plasma filtrate through said opening in response to pressure differentials between the plasma-poor blood in said first chamber and the plasma filtrate in said second chamber to establish and thereafter maintain substantial equilibrium between the pressure of the plasma filtrate and the pressure of the plasma-poor blood.

4,412,554

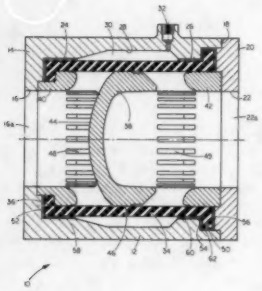
FIRE SAFE EXPANSIBLE TUBE TYPE VALVE

Peter C. M. Chow, Newark, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Jul. 29, 1981, Ser. No. 288,107

Int. Cl.³ F16L *7/00*

U.S. Cl. 137—375 **2 Claims**



1. An expansible tue valve comprising:

a valve body;

end closures on said body defining inlet and outlet passageways;

a generally cylindrical slotted core within said body with annular end portions, a circular barrier extending across said core intermediate said end portions with a sealing surface around it, and flow slots through and around said core on both sides of said barrier;

a flexible, expansible tube around said core snugly embracing said sealing surface;

a pair of cylindrical inner surfaces near the ends of said body closely embracing said expansible tube;

intermediate inner surfaces of said body being in spaced relationship to said tube to enable radial expansion thereof;

one of said cylindrical inner surfaces terminating in an outward facing shoulder; and

an out-turned integral radial flange around one end of said tube clamped between said shoulder and an end closure to form a seal therewith; said valve being characterized in the provision of means for protecting said expansible tube form external heat comprising:

a pair of thin tubular rings of heat insulation material in said body, each coextensive with one of said cylindrical inner surfaces and interposed between said one cylindrical surface and said expansible tube;

a third tubular ring of heat insulation material coextensive with the edge of said out-turned flange and interposed between said edge and said valve body; and

flat rings of heat insulation material in said body interposed between the sides of said radial flanges and said shoulder and end closure, respectively.

4,412,555

OVER PRESSURE RELEASE VALVE FOR A HYDRAULIC INSTALLATION

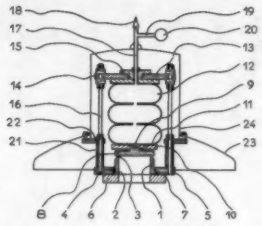
Gilles Combes, Grenoble, France, assignor to Societe Anonyme dite: Alsthom-Atlantique, Paris, France

Continuation of Ser. No. 194,479, Oct. 6, 1980, abandoned. This application May 28, 1982, Ser. No. 383,309

Claims priority, application France, Oct. 12, 1979, 79 25427

Int. Cl.³ F16K *15/00*

U.S. Cl. 137—524 **3 Claims**



1. An over-pressure release valve for a hydraulic installation, said valve including:

a circular seat,

a disk having an annular surface on one side which cooperates with the seat, said one side of the disk being subject to pressure of a liquid in a hydraulic installation;

a thrust member positioned on the other side of the disk; and

means for supporting the thrust member relative to the seat so as to press the disk against the seat, wherein the improvement comprises:

said thrust member being substantially cylindrical longitudinally flexible chamber mounted coaxially with the disk and the seat, the thrust exerted by said chamber against the other side of the disk being a function only of gas pressure therein;

the means for supporting the thrust member comprising a plurality of circumferentially spaced rods extending parallel to the axis of said chamber and spaced radially therefrom, such that the chamber is laterally unsupported and a substantially unrestricted flow area is provided around the seat between said rods; and

the diameter of the disk being from 1.20 to 1.25 times that of the opening in the seat, and the disk being unguided and restrained only by said flexible chamber such that liquid from the hydraulic installation can flow in an unrestricted sheet when the disk lifts off the seat due to a sudden overpressure in said installation.

4,412,556

DEVICE FOR SHUTTING OFF LARGE PIPES

Hans-Jurgen Janich, Regelkamp 12, D-4720 Beckum, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,516

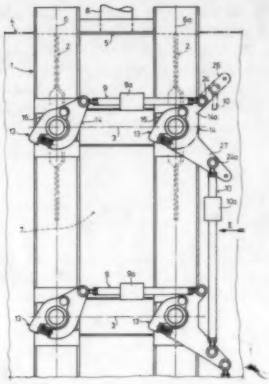
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023639

Int. Cl.³ F16K *1/22*

U.S. Cl. 137—614.11 **15 Claims**

1. In apparatus for regulating the flow of fluid through a large, elongate pipe including a number of shafts spaced from one another and mounted on said pipe for rotation about parallel axes transverse to the longitudinal axis of said pipe, a plurality of flaps corresponding to the number of said shafts and connected to the latter for rotation therewith between one rotary position in which said flaps oppose the flow of fluid longitudinally of said pipe and a second rotary position facilitating the flow of fluid longitudinally of said pipe, and common drive means connected to said shafts for rotating them concurrently, the improvement wherein said drive means comprises first and second double-arm levers for each of said shafts, one

of said levers being fixed to the associated shaft and having one arm thereof pivotally connected to one arm of the second of said levers; and an actuating rod connecting said one arm of



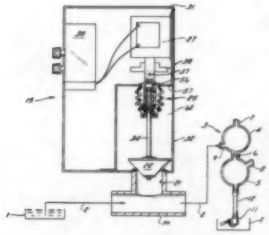
each of said second levers to the corresponding arm of an adjacent one of said second levers, whereby rotation of any one of said levers is imparted to the remainder thereof.

4,412,557

VALVE APPARATUS FOR FLUID CONVEYING SYSTEM

Rolyn A. Schmid, Hayward, Wis., assignor to Bender Machine Works, Inc., Hayward, Wis.

Filed Nov. 25, 1981, Ser. No. 324,838
Int. Cl.³ F16K *31/02*
U.S. Cl. 137—624.13 **4 Claims**



1. A valve apparatus for use in a fluid conveying system and including:

a housing including a plate defining a lower chamber in said housing, said plate having an aperture therethrough;

a fluid conveying conduit connected to said housing which is capable of being under vacuum and having an opening communicating with said lower chamber and from thence to atmosphere, said opening having a valve seat thereabout;

a stopper plug located in said lower chamber above said opening and movable between a closed position wherein it engages said valve seat and is held thereagainst by vacuum in said conduit to prevent air entry into said conduit and an open position above said valve seat to permit air entry into said conduit through said opening from said lower chamber;

timed drive means including a solenoid mounted in fixed position on said housing above said plate and having a stationary coil and a vertically movable armature;

a hollow bushing pivotally connected to and movable with said armature and extending downwardly through said aperture in said plate, said bushing including a bore closed at its upper end and open at its lower end;

a stop member on said bushing near said lower end of said bore;

a connecting rod having a lower end connected to said plug and having its upper end extending into the open end of said bore in said hollow bushing;

a projection on said connecting rod near said upper end thereof;

a cushion disposed in said bore between the closed end thereof and said upper end of said connecting rod;

a compression type biasing spring in said bore and disposed around said rod between said stop member on said bushing and said projection on said connecting rod;

a flexible boot connected to said bushing and to said plate around said aperture in said plate to prevent contaminants from entering said lower chamber;

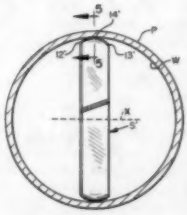
said solenoid coil when energized initially operating to effect upward vertical movement of said armature and of said bushing relative to said connecting rod thereby effecting compression of said spring, said solenoid coil effecting subsequent further upward vertical movement of said armature to effect movement of said plug away from said valve seat as said bushing, the compressed spring and said connecting rod are moved upwardly together by said armature, whereupon said spring decompresses and moves said connecting rod upwardly within said bushing and moves said plug rapidly upward away from said valve seat, said solenoid coil when de-energized allowing said armature, said bushing, said connecting rod and said plug to descend under the force of gravity so that said plug re-engages said valve seat.

4,412,558

TURBULATOR

Michael J. Burke, Boring, and Harry E. Fowler, Corbett, both of Oreg., assignors to Western Fuel Reducers, Inc., Troutdale, Oreg.

Continuation-in-part of Ser. No. 107,844, Dec. 28, 1979, abandoned. This application Aug. 25, 1981, Ser. No. 296,198
Int. Cl.³ F15D *1/02*; B01F *15/06*
U.S. Cl. 138—38 **6 Claims**



1. A turbulator comprising a strip bent into zig-zag form to provide two spaced essentially parallel series of apices for contact with the interior wall of a gas conducting tube,

each apex being so formed as to present an outwardly facing convex surface including a central area of contact surrounded on all sides by areas of double curvature,

the side edges of the strip at the apices being located closer to the midplane of the strip than are said central areas of contact,

the height of the turbulator being a number of times greater than the width of the strip,

said central areas of contact providing for each apex a single area of contact with the tube.

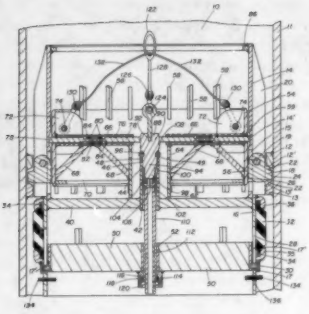
4,412,559
DOG LOCKING SLEEVE

Steven G. Streich; R. Benton Nickles, and Harold O. Treece, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 194,316, Oct. 6, 1980, abandoned. This application Jul. 9, 1982, Ser. No. 396,990

Int. Cl.³ F16L *55/12, 55/10*

U.S. Cl. 138—89 **4 Claims**



1. A removable plug for temporarily sealing the interior of an annular member to prevent the flow of fluid therethrough, said removable plug comprising:

plug body means adapted to be disposed within said annular member, the plug body means comprising:

packer mandrel means having a plurality of apertures therein and having a plug therein for preventing the flow of said fluid therethrough, the plug having a centrally located sleeve therein;

packer member means located on the packer mandrel means for sealingly engaging the interior of said annular member;

packer setting sleeve means located on the packer mandrel means for compressing the packer member means into sealing engagement with the interior of said annular member;

locking dog means pivotally mounted on the packer mandrel means for retaining said plug from axial movement when installed in said annular member, the locking dog means comprising:

a plurality of members pivotally mounted on the packer mandrel means, each member having a portion thereof adapted to engage a portion of the interior of said annular member when said plug is installed therein and being rotatable through an aperture of the plurality of apertures in the packer mandrel means;

pressure equalization means releasably secured within the centrally located sleeve of the packer mandrel for allowing the flow of said fluid through said plug when said plug is installed in said annular member thereby allowing the pressure of said fluid to substantially equalize in said annular member and across said plug before the removal of said plug from said annular member;

annular dog locking sleeve means slidable within the packer mandrel means between a first position wherein the locking dog means abut a portion of the exterior surface of the dog locking sleeve means thereby preventing rotation of the locking dog means through the apertures in the packer mandrel means and a second position wherein the locking dog means are free to rotate through the apertures in the packer mandrel means thereby disengaging the interior of said annular member when said plug is installed therein to allow the removal of said plug from said annular member; and

dog locking sleeve extension means secured to one end of the annular dog locking sleeve means, the dog locking sleeve extension means adapted to slidably engage the interior of the packer mandrel means, the dog locking sleeve extension means comprising:

a plurality of elongate members, each member having a portion thereof secured to the annular dog locking sleeve means and the remaining portion extending beyond the annular dog locking sleeve means to slidably engage the interior of the packer mandrel means such that the combination of the annular dog locking sleeve means and dog locking sleeve extension means has a ratio of axial length to the diameter of the exterior surface of the dog locking sleeve means of greater than approximately 0.3.

4,412,560
TUBE FOR A CRACKING PLANT

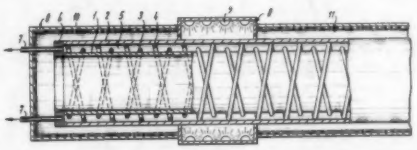
Johannus J. Broodman, Breskens, Netherlands, assignor to B. V. Koninklijke Maatschappij "De Schelde", Vlissingen, Netherlands

Continuation-in-part of Ser. No. 126,715, Mar. 3, 1980, abandoned. This application Mar. 26, 1982, Ser. No. 362,298

Claims priority, application Netherlands, Mar. 2, 1979, 7901692

Int. Cl.³ F16L *9/16*

U.S. Cl. 138—143 **7 Claims**



1. A cracking tube for a cracking plant in which tube the cracking reaction occurs at a temperature of 900° and 1300° C. and at a pressure 200–500 kPa, said cracking tube having a corrugated structure prepared from an inner tube consisting of a metal capable of withstanding at, above said temperature, an aggressive corrosive medium which may prevail inside the inner tube, a reinforcement having been placed about said inner tube, said reinforcement being provided with a plurality of openings between the reinforcement parts and consisting of a metal capable of withstanding, at above said temperature compressive and tensile forces, to be exerted on the tube at above said pressures, an outer tube coaxially positioned about the inner tube and the reinforcement and consisting of a metal capable of withstanding at above said temperature an aggressive corrosive medium which may prevail outside the outer tube, said reinforcement being made of tungsten, molybdenum or tantalum or alloys of tungsten, molybdenum or tantalum, said inner tube and the outer tube being made of nickel or nickel alloy and having been bonded together in the openings between the reinforcement parts upon application of heat and pressure on the inner surface of the inner tube and outer surface of the outer tube while applying vacuum to the openings between the reinforcement parts.

4,412,561
GLASS FIBER-REINFORCED CEMENT NON-PLATE ARTICLES

Keizo Sakaguchi, Kawanishi, and Shigeru Takeuchi, Osaka, both of Japan, assignors to Kurimoto Iron Works, Ltd., Osaka, Japan

Filed Jan. 7, 1981, Ser. No. 222,861

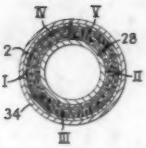
Claims priority, application Japan, Jan. 11, 1980, 55-2834; Apr. 28, 1980, 55-58227

Int. Cl.³ F16L *9/08*

U.S. Cl. 138—174 **10 Claims**

1. A glass fiber-reinforced, cement mortar article having a non-planar shape, which comprises an inner layer comprised of a mixture of Portland cement and chopped glass fiber strands; a first layer of continuous glass fibers located on said inner

layer; an outer layer comprised of a mixture of Portland cement and chopped glass fiber strands; a second layer of continuous glass fibers located on said outer layer; and an intermediate layer comprised of regulated set cement interposed between said inner and outer layers.

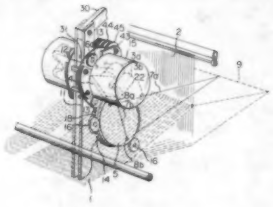


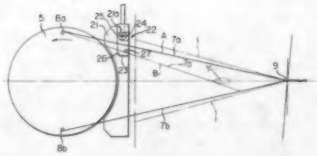
4,412,562

APPARATUS FOR FORMING SELVAGES IN WEAVING MACHINES

Takeshi Kobayashi, Aichi, and Hajime Suzuki, Anjo, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki, Kariya, Japan

Filed Oct. 14, 1981, Ser. No. 311,255
Claims priority, application Japan, Oct. 15, 1980, 55-143842
Int. Cl.³ D03C *11/00*; D03D *47/40*
U.S. Cl. 139—54 **4 Claims**





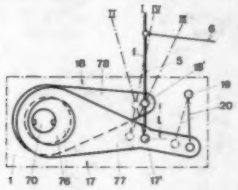
1. Apparatus for forming a selvage in a weaving machine, comprising a moveable shed forming member having selvage thread guide eyelets through which selvage threads pass to provide each of the selvage threads with upward and downward movements when said shed forming member moves, thereby allowing the selvage threads to catch a weft thread, and a device for detecting abnormal conditions of the selvage threads disposed between said shed forming member and the fell of the cloth and within the range of the upward and downward movements of the selvage threads, said detecting device comprising a pair of legs disposed on opposite sides of said upwardly and downwardly moving selvage threads and photocell means comprising light emitting and receiving elements mounted on the inner sides of said legs so as to face each other for producing a light beam and detecting an interruption of the light beam by the selvage threads upon their upward and downward movements, means for counting the number of said light interruptions, and means for comparing the counted number with a predetermined number to thereby decide whether or not an abnormal condition of the selvage threads exists.

4,412,563

MULTIPOSITION DOBBY

Walter Kleiner, Hirzel-Zurich, Switzerland, assignor to Staeubli Ltd., Horgen-Zuerich, Switzerland

Filed Jun. 22, 1981, Ser. No. 276,544
Claims priority, application Switzerland, Jul. 1, 1980, 5047/80
Int. Cl.³ D03C *1/00, 1/06*
U.S. Cl. 139—66 R **13 Claims**



1. A dobby for controlling a multiposition heddle frame, comprising first and second rotation lifting units arranged adjacent each other on a common rotationally driven drive shaft and respectively having first and second connecting rods which extend and are supported for movement in directions generally radial of said drive shaft and form an acute angle with respect to each other, a lever pivotally supported on said first connecting rod at a first location spaced from said drive shaft and pivotally supported on said second connecting rod at a second location spaced from said drive shaft and from said first location, a third connecting rod pivotally supported on said lever at a third location spaced from said first and second locations, means operatively coupling said third connecting rod to said heddle frame for effecting movement of said heddle frame in response to movement of said third connecting rod effected by pivotal movement of said lever, and means for preventing angular movement of said first and second connecting rods with respect to the axis of said drive shaft.

4,412,564

APPARATUS FOR FORMING AN INTERPOLE CROSSOVER WIRE BETWEEN STATOR COILS

Tokuhito Hamane, Hirakata; Toshio Kinoshita, Katano, and Masafumi Kihira, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 23, 1981, Ser. No. 237,404
Int. Cl.³ B21F *3/00*
U.S. Cl. 140—92.1 **3 Claims**

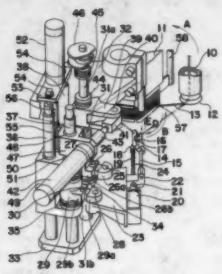
1. An apparatus for forming an interpole crossover wire between a succession of continuous stator coils each wound around the spool of a winding apparatus with successive coils being wound in opposite directions, said forming apparatus comprising:

a pair of wire engaging pawls relatively movable toward and away from each other to engage and release a wire;

pawl driving means connected to said pawls for relatively moving said pawls;

a link mechanism on which said pawls are mounted for

movement in a circular arc between a position adjacent the spool where said pawls are positioned to engage a wire extending between the coil being wound and the means for winding the wire and a position spaced away from the spool, the movement in the circular arc drawing wire out



to form the interpole crossover wire, said link mechanism including means for adjusting the dimensions thereof for changing the arc along which the pawls are moved during movement of the link mechanism; and

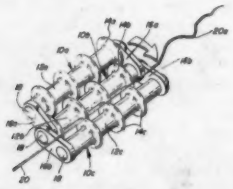
link mechanism drive means connected to said link mechanism for driving said link mechanism.

4,412,565

WIRE STRAIGHTENER TOOL

Dewey O. Broberg, Jr., Long Grove, Ill., assignor to Du-Bro Products, Inc., Wauconda, Ill.

Filed Apr. 15, 1982, Ser. No. 368,826
Int. Cl.³ B21F *1/02*
U.S. Cl. 140—123 **15 Claims**



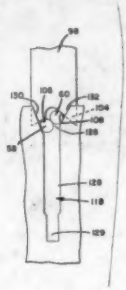
1. A hand tool for straightening wire, comprising: at least three elongated wire straightener members each having a plurality of wire engaging surfaces spaced longitudinally of the respective straightener member; and means interconnecting said wire straightener members for pivotal movement about axis means extending generally parallel to the longitudinal axes of the wire straightener members between an open position and a closed position with the wire straightener members in said closed position defining a longitudinal passageway between said wire engaging surfaces extending generally parallel to the longitudinal axes of the wire straightener members for receiving a wire and straightening the wire in response to relative longitudinal movement of the wire in said passageway as pressure is applied exteriorly of the wire straightener members.

4,412,566

APPARATUS FOR TRANSPOSING A PAIR OF PARALLEL AND ADJACENT CONDUCTORS INTO A VERTICAL RELATIONSHIP

Clifton W. Huffnagle, Camp Hill; LeRoy J. Morningstar, Middletown, and Charles I. Tighe, Jr., Hershey, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 23, 1979, Ser. No. 97,015
Int. Cl.³ B21F *1/02*
U.S. Cl. 140—147 **8 Claims**



1. Apparatus for transposing a pair of conductors from a horizontal, axially parallel and adjacent orientation to a non-horizontal orientation, comprising:

template means having a profiled channel means extending therein, said channel means having a transition region dimensioned for closely receiving said conductors therein and being defined by first and second conductor directing surface means, said first conductor directing surface means adapted to delay movement of one of the pair of conductors when the one of the pair of conductors is moved into engagement therewith while the other of the pair of conductors in engaging said second conductor directing surface means is directed and guided to a central position of the channel means underneath the delayed one of the pair of conductors so that the conductors will be overlapped; and

blade means for pushing the conductors of the pair of conductors along said first and second conductor directing surface means including bight means and first and second conductor pushing surface means, one of said first and second conductor pushing surface means being longer than the other, said first and second conductor pushing surface means adapted to engage respectively the other and the one of the pair of conductors, pushing the other of the pair of conductors along said second conductor directing surface means to said central position while the one of the pair of conductors in moving along said first conductor directing surface means is also moved along said second conductor pushing surface means into said bight means thereby placing the one of the pair of conductors over the other of the pair of conductors whereafter said blade means moves the overlapped conductors to the bottom of said channel means.

4,412,567

SILO BAG FILLING MACHINE

Larry J. Kosters, Sioux Center, Iowa, assignor to Roto Press Limited, Sioux Center, Iowa

Filed Nov. 2, 1981, Ser. No. 317,497
Int. Cl.³ B65B *3/08*
U.S. Cl. 141—114 **19 Claims**

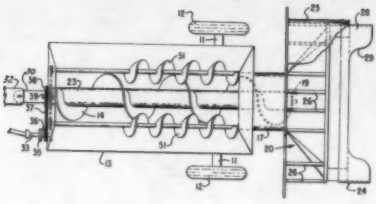
1. A device for filling material into a horizontal silo bag at its inlet, said device comprising:

a frame;

traverse means, mounted on said frame and engageable with the ground, for moving said frame relative to the ground;

means on said frame for receiving material, said material

receiving means being formed to hold said silo bag, said material receiving means including a hopper, chute means for projecting the material into said bag, and means for delivering the material from said hopper to said chute means, said delivering means including an auger and an auger housing, said auger housing having a discharge end,



said bag having an inlet end, said discharge end being substantially centered with respect to said inlet end, said chute means having walls inclining outwardly from said discharge end of said auger housing to said inlet end of said bag; and

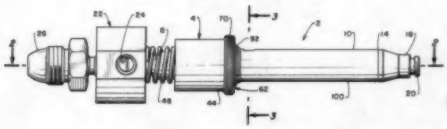
means for driving said auger at one end of said auger.

4,412,568

FILL VALVE

Richard E. Hughes, Hermosa Beach, Calif., assignor to Otto K. Henke, San Pedro, Calif.

Filed Aug. 24, 1981, Ser. No. 295,644
Int. Cl.³ B65B 3/04
U.S. Cl. 141—392 **16 Claims**



1. A fill valve for at least two fluids comprising the combination:

a body member having a fluid pathway therethrough and having an inlet portion adapted for connection to a first fluid under pressure, and an outlet portion defining a venturi configuration, said body member having a first orifice communicating said fluid pathway to the exterior of said body member, and a second, spaced orifice adapted to communicate said fluid pathway to a second fluid supply;

a pneumatically responsive closure member operably disposed in fluid tight relationship against the exterior of said body member adjacent said first orifice and being biased into a first position normally closing said second orifice and a second position opening said second orifice for communication to said second fluid; and

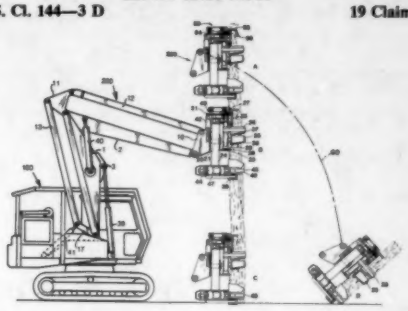
a metering member cooperatively associated with said body member to selectively meter said second fluid supplied to said second orifice.

4,412,569

TREE HARVESTING METHODS AND MACHINES

John S. Barnett, Putaruru, and Sydney D. B. Cochrane, Tokoroa, both of New Zealand, assignors to Waratah General Engineering Ltd., Tokoroa, New Zealand

Filed Sep. 2, 1980, Ser. No. 182,980
Claims priority, application New Zealand, Aug. 31, 1980, 191447
Int. Cl.³ A01G 23/08
U.S. Cl. 144—3 D **19 Claims**



1. A method of harvesting a tree comprising the steps of:

(i) positioning a vehicle-mounted tree harvester apparatus including a head member adjacent to the upper trunk of a standing tree by support means extending from said vehicle;

(ii) clasping delimbing means of said head member about the tree in a close fitting relationship;

(iii) delimbing the tree by releasing said support means for said head member so that the head member gravitates down said tree independently of support from said tree, with the delimbing means in a clapsed relationship about the tree, and controlling the alignment of said head member relative to said tree by control means during said downward gravitation;

(iv) clamping said head member about the base of the tree;

(v) shearing off said tree;

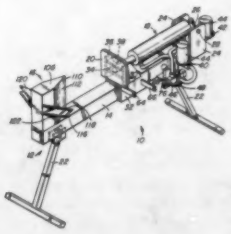
(vi) operating said support member so as to position the tree clamped within said head member where required, and releasing the tree from said head member.

4,412,570

WOOD SPLITTER

L. Douglas Nickerson, 306 Reid St., Sault Ste. Marie, Ontario, Canada (P6B 4V1)

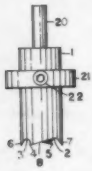
Filed May 11, 1981, Ser. No. 262,487
Claims priority, application Canada, Apr. 23, 1981, 376097
Int. Cl.³ B27L 7/00
U.S. Cl. 144—193 A **5 Claims**



1. A splitting head for a wood splitting device, said head comprising a vertical knife adapted for mounting on a support

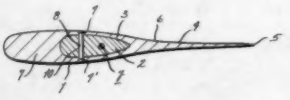
beam of the splitting device with the cutting edge of said vertical knife being at right angles to said support, said vertical knife having side surfaces and a V-shaped leading edge in plan view, and a pair of wing knives secured to and extending outwardly from the sides of said vertical knife, each wing knife of said pair having upper and lower planar surfaces converging to a single leading edge that is located substantially at right angles to the side surfaces of the V-shaped leading edge of the vertical knife; the lower surface of each wing knife being parallel to the support beam on which the head is to be mounted, and the upper surface of each wing knife extending upwardly and rearwardly from the leading edge of said wing knife; the leading edges of the wing knives being set well back from the leading edge of the vertical knife to provide a two stage splitting action on a wood block driven into the head.

4,412,571
POWER CHISEL
John F. Czerniewicz, 337 Foch Blvd., Mineola, N.Y. 11501
Filed Jun. 11, 1981, Ser. No. 272,739
Int. Cl.³ B27G *13/00*; B27C *5/10*
U.S. Cl. 144—219 **3 Claims**



1. A laterally movable motor driven cutting means adapted to cut grooves of predetermined depth comprising:
cutting means having a hollow tubular cutting end,
a plurality of peripheral chisel cutting edges formed in said tubular end, and semi-elliptical knife-like portions in said tubular end separating the cutting edges.

4,412,572
SPLITTING AXE
Thomas A. Clark, Star Rte. 287, Box 5780, Potosi, Mo. 63664
Filed Aug. 19, 1981, Ser. No. 294,318
Int. Cl.³ B26B *23/00*
U.S. Cl. 145—2 R **3 Claims**

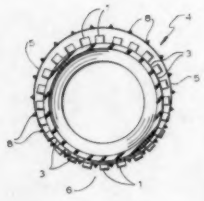


1. A splitting axe having a head unbalanced with respect to a handle of said axe, said head having an eye, said handle having a portion received within said eye, said head having an anterior portion extending from one end of said eye and terminating in a cutting edge at one end of said head and a posterior portion extending from the opposite end of said eye to the end of said head remote from said cutting edge, the mass of said head having a weight distribution for providing an unbalanced disposition of said head on said handle whereby the center of gravity of said head is located within said eye and upon an axis passing through said center of gravity and parallel to the longitudinal center line of said eye, said axis being located anteriorly of said longitudinal center line, said center of gravity axis accordingly lying between said longitudinal center line and the anterior limit of said eye, said posterior portion being weighted and oriented posteriorly relative to said longitudinal center line.

4,412,573
INJECTION SITE
Brian D. Zdeb, Round Lake Park, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Dec. 28, 1981, Ser. No. 335,133
Int. Cl.³ B65D *41/50*
U.S. Cl. 604—415 **21 Claims**

1. A needle-pierceable injection site comprising:
a generally tubular port including a base end and a top end;
a needle-pierceable membrane extending across and closing said base end;
said generally tubular port and needle-pierceable membrane defining a volume, said top end defining a substantially circular opening to said defined volume; and
a needle-pierceable compressed situs of self-sealing material having the form of a sphere in its unstressed state, disposed in said generally tubular port and retained in compressive sealing relation thereto.

4,412,574
ELEMENT FOR REMOVING DIRT OR SNOW FROM TIRE, AND TIRE PROVIDED THEREWITH
Gregory Popok, 8003 "B" Woodgate Ct., Baltimore, Md. 21207
Filed Sep. 29, 1982, Ser. No. 426,653
Int. Cl.³ B60C *27/00*, *11/00*
U.S. Cl. 152—151 **6 Claims**



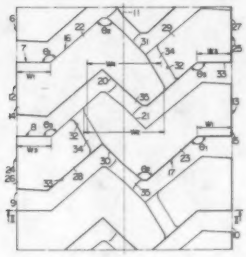
1. An element for removing dirt or snow from tires having grooves, comprising:
a closed substantially rigid member arranged so that it can be fitted onto a tire and at least partially received in its circumferentially extending groove, said member having such a radial dimension that one portion of said member is pressed by the ground into the circumferential groove at the location of contact of the tire with the ground, and upon rotation of the tire when the one portion moves out of the location of contact and a new portion of said member moves into the location of contact, said one portion of said member displaces radially outwardly and dislodges dirt and snow from the tire.

6. A tire unit, comprising
a tire having an outer surface provided with grooves; and
an element for removing dirt or snow from the tire and formed as defined in claim 1.

4,412,575
HEAVY LOAD PNEUMATIC RADIAL TIRE

Muneyoshi Maeda, Kodaira, and Masaru Abe, Sayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,355
Claims priority, application Japan, Jun. 13, 1980, 55-80620
The portion of the term of this patent subsequent to Jul. 6, 1996, has been disclaimed.
Int. Cl.³ B60C *11/04*
U.S. Cl. 152—209 R 6 Claims



1. A heavy load pneumatic radial tire provided with a tread portion having an outer peripheral configuration which is formed to have a radius of curvature ranging from 195 to 255 percentage of the width of said tire;

said tread portion being constructed by a long block group and a short block group which are alternately arranged at substantially equal intervals in the circumferential direction of said tread portion;

said long block group consisting of a plurality of long blocks staggeredly arranged and extending substantially laterally across the mid-circumferential plane of said tread portion from opposite sides of said tread portion, each of said long blocks being formed by a base portion extending substantially laterally from a said side toward said mid-circumferential plane and a V-shaped portion extending from said base portion over said mid-circumferential plane, said V-shaped portion having a laterally outer half adjacent said base portion and a laterally inner half remote from said base portion and intersected by said mid-circumferential plane; said V-shaped portion also having an inner side face and an outer side face, the inner side face of said laterally inner half of said V-shaped portion being spaced apart from and in face-to-face and substantially parallel relationship to the outer side face of the laterally inner half of the V-shaped portion of an adjacent long block;

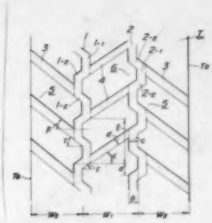
said short block group consisting of a plurality of short blocks staggeredly arranged between two adjacent long blocks and extending substantially laterally from a said side toward and terminating outwardly from said mid-circumferential plane, each of said short blocks being formed by a base portion adjacent a said side and spaced apart from and in parallel relationship to adjacent said base portions of said long blocks and a slanted portion extending toward said mid-circumferential plane in parallel relationship to said laterally outer halves of the V-shaped portions of adjacent said long blocks;

each of said short blocks having a lateral inner end face which is spaced apart from and in face-to-face relationship with an opposed face of said V-shaped portion of a long block for forming a first groove, said first groove having a center spaced apart from that of an adjacent first groove in the lateral direction of said tread portion at a predetermined lateral distance which ranges from 30 to 42 percentage of the width of said tread portion.

4,412,576
PNEUMATIC SNOW TIRE

Yukio Nakajima, Higashimurayama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,799
Claims priority, application Japan, Jun. 29, 1981, 56/101017
Int. Cl.³ B60C *11/00*
U.S. Cl. 152—209 R 7 Claims



1. A pneumatic snow tire comprising: a pair of sidewalls and a tread extending therebetween, said tread having a pair of main circumferential grooves substantially equally dividing said tread along circumferential directions and bias grooves oblique to the circumferential directions connecting between said main circumferential grooves and between said main grooves and tread edges to form a number of blocks defined by said main and bias grooves,

(a) said main circumferential grooves each consisting of circumferential grooves components substantially in parallel with the circumferential direction and bias groove components oblique to the circumferential direction alternately connected to form a staggered groove and being shifted relative to one another in the circumferential direction, wherein the shifted length (a) of said main circumferential grooves is in a relation of $0.25l \leqq (a) \leqq 0.75l$, where l is a pitch length of the main circumferential grooves,

(b) an amplitude b of said main zigzag grooves in width directions of the tread and a width c of said main circumferential grooves being in a relation $b > c$, and

(c) said bias groove extending from connections of said circumferential and bias groove components of said main circumferential grooves in directions of the bias groove component, and

(d) a width of said circumferential groove being wider than an average width of said bias grooves.

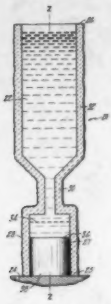
4,412,577
CONTROL OF SEED MELT-BACK DURING DIRECTIONAL SOLIDIFICATION OF METALS

Richard W. Salkeld, South Windsor; Neal P. Anderson, Broad Brook, and Anthony F. Giamei, Middletown, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 27, 1982, Ser. No. 343,083
Int. Cl.³ B22D *25/00*
U.S. Cl. 164—122.2 6 Claims

1. The process of directional solidification from molten metal of an article having a structure which is epitaxial with a seed which comprises forming a mold, placing an original seed within the mold, heating the mold, melting a portion of the seed by contacting a seed surface with molten metal placed in the mold, and epitaxially solidifying the molten metal, characterized by melting a portion of the seed length which is at least 25% of the original seed length, the melted portion of the seed length being measured from the original molten metal contacting surface before melting to the location of the liquidus interface after melting, the melting being sufficient to cause physical disruption of surface films on the surface of the seed where it is contacted by molten metal to be epitaxially solidified, and

insufficient to raise above the metal solidus temperature the portion of the seed which is most distant from the region



where it is contacted by the molten metal to be epitaxially solidified.

4,412,578

APPARATUS FOR TREATING MOLTEN CAST IRON

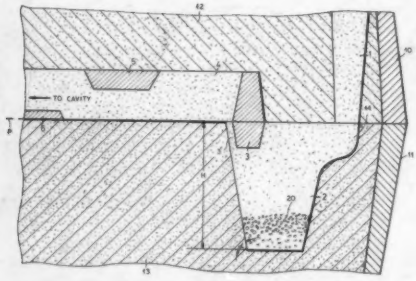
Ernst J. Doliwa, Niddatal; Karl J. Reifferscheid, Karben, and Friedrich Wolfsgruber, Teacherting, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main and SKW Trostberg, Trostberg, both of, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 244,955

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010623

Int. Cl.³ B22D *27/00*

U.S. Cl. 164—349 **1 Claim**



1. A casting mold for making castings of cast iron containing vermicular and spheroidal graphite, comprising:

means forming a runner leading to a mold cavity;

a sprue for feeding metal into said cavity;

a reaction chamber between and below said sprue and said runner for receiving a graphitizer and reacting said graphitizer with a cast iron melt, said reaction chamber being of downwardly convergent cross section and having a wide end lying in a parting plane of the mold, said chamber being of frustopyramidal configuration having:

a broad rectangular base in said parting plane of said mold,

a wall extending upwardly at an angle of 50° to 80° to the horizontal,

a height which is substantially two to three times the width of one of the bases of said chamber, and

at least one of said bases generally of square configuration; and

a bar of trapezoidal cross section extending downwardly from said runner into said reaction chamber and having a flank parallel to said wall at an upper end thereof whereby said flank and said wall define an outlet from said reaction chamber into said runner which lies below the inlet from said sprue into said reaction chamber.

4,412,579

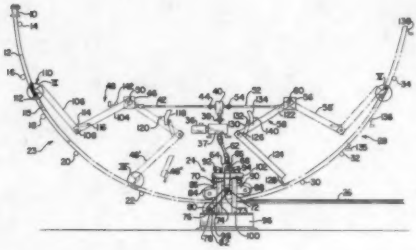
APPARATUS FOR HANDLING A CONTINUOUS CASTING MACHINE STARTER BAR

Tamas Zavodszky, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 7, 1982, Ser. No. 376,019

Int. Cl.³ B22D *11/16, 11/08*

U.S. Cl. 164—413 **15 Claims**



1. In a continuous metal casting machine having an elevated vertical flow through casting mold connected at its lower end to a downwardly curving strand conveying structure having a lower discharge end oriented in a substantially horizontal direction, a strand starting bar engageable with the lower end of the mold and conformable in curvature to the strand conveying structure, a strand receiving structure laterally extending from the discharge end of the downwardly curving strand conveying structure, a curved starting bar receiving structure vertically displaced above said strand receiving structure and extending upwardly and away from the discharge end of the downwardly curving strand conveying structure, and a strand straightener and starting bar advancing apparatus having at least one set of rotating roller members interposed between said discharge end of the downwardly curving strand conveying structure and said strand and starting bar receiving structures, wherein the improvement comprises:

(a) a first arm member having a fixed end that is pivotally mounted at a point vertically displaced above at least a portion of the downwardly curving strand conveying structure so that said first arm member pivots from an upper position adjacent the mold to a lower position adjacent the straightener apparatus through a vertical arc substantially coplanar with said downwardly curving strand conveying structure;

(b) selectively connectable first starter bar engagement means terminally mounted on said first arm member;

(c) control means for releasing said first starter bar engagement means when the starter bar has been engaged by the straightener apparatus;

(d) a second arm member having a fixed end that is pivotally mounted at a point vertically displaced above at least a portion of the upwardly curving starter bar receiving structure so that said second arm member pivots from a lower position adjacent the straightener apparatus to an upper storage position through a vertical arc substantially coplanar with said upwardly curving starter bar receiving structure;

(e) selectively connectable second starter bar engagement means terminally mounted on said second arm member; and

(f) control means for engaging said second starter bar engagement means when the starter bar has been discharged from the straightener apparatus, such that after the starter bar has been displaced from the mold to the straightener apparatus by movement of the first arm member from its

upper to its lower position and the starter bar is advanced through the straightener apparatus by rotation of the roller members, the starter bar will then be engaged by the second arm member and withdrawn to said upper storage position.

4,412,580

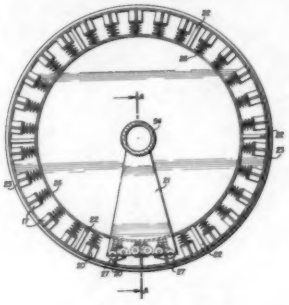
COOLING APPARATUS FOR WHEEL-BAND CONTINUOUS CASTING MACHINES

Kenneth E. Chadwick; E. Henry Chia; Robert H. Ogletree; Frank M. Powers, all of Carrollton, and Larry S. Richardson, Bowdon, all of Ga., assignors to Southwire Company

Filed Nov. 26, 1980, Ser. No. 210,655

Int. Cl.³ B22D *11/06, 11/00*

U.S. Cl. 164—433 **5 Claims**



1. In a continuous metal casting machine of the type having an arcuate mold cavity formed by a peripheral groove in a rotatable casting wheel and an endless metallic band which seals a portion of said groove, and having multiple band support wheels, one of which is tangent to the casting wheel at the entrance to the mold and functions to press the band against said casting wheel, the improvement comprising:

conduit means for supplying a flow of coolant to the interior of said one of band support wheels; sealable passageways, in the periphery of said support wheel, which communicate with the interior of said support wheel; movable means for sealing said passageways; and means for moving said sealing means thereby unsealing said passageways and allowing coolant to flow from the interior of said support wheel to and through the periphery of said support wheel and thence onto the band and wherein said movable means for sealing said passageways further comprises:

a resilient block adapted to sealingly cover said passageways, spring means for urging said block to cover said passageways, and lifting means attached to said block for moving the block against the urging of the spring means so as to uncover said passageways.

4,412,581

HEATING INSTALLATION COMPRISING A BOILER AND A HEAT PUMP

Kristian Iversen, Sønderborg, and Henning Hansen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

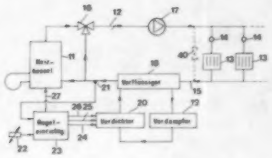
Filed Mar. 1, 1982, Ser. No. 353,576

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, 3109843

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—29 **3 Claims**

1. A heating installation comprising a boiler, a heat pump, at least one radiator with a preceding temperature control valve, supply and return lines extending from said boiler to said radiators, a mixer valve between said supply and return lines, internal and external temperature sensors, control means for said boiler and heat pump having said sensors as inputs, said heat pump having in a closed circuit a multi-stage compressor, a condenser in said return line and an evaporator subjected to external heat, said internal temperature sensor being in said return line between said boiler and said condenser, a graded set of threshold valve operating switches for said multi-stage compresser and a threshold valve operating switch for said boiler having a higher threshold than any switch of said set of switches, temperature converter means connected to said



external temperature sensor for providing an inverse signal relative thereto, limiter means connected to said temperature converter means for limiting said inverse signal thereof to the upper temperature operating limit of said compressor, comparator means having inputs connected to said internal temperature sensor and the output of said limiter means, and integrator means between said comparator means and said switches for selecting compressor and boiler outputs in response to comparisons between indoor and outdoor temperatures made by said comparator means.

4,412,582

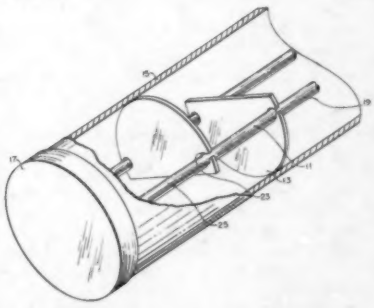
BAFFLE ARRAY FOR HEAT EXCHANGE APPARATUS

Walter P. Mecozzi; Gary C. Mager, both of North Tonawanda, and Stephen A. Maliszewski, Lockport, all of N.Y., assignors to Hiross, Inc., Niagara Falls, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,850

Int. Cl.³ F28F *7/00*

U.S. Cl. 165—76 **7 Claims**



1. An internal baffle array for a heat exchange unit comprising a plurality of longitudinal spacer rods, each having a body portion and a protruded portion along the length thereof, said protruded portions having a plurality of slots therein at spaced intervals, and a plurality of baffle plates positioned at right angles to said spacer rods, said baffle plates each having a plurality of openings at the periphery thereof adapted to receive at least the body portions of said rods, with said spacer rods passing through the openings in said baffle plates and holding the baffle plates in desired spacing relationship by engagement of the widths of said plates within said spaced slots

in said protruded portions of said rods upon rotations of the rods.

4,412,583

APPARATUS AND METHODS FOR COOLING EXHAUST GAS STREAMS CONTAINING SUSPENDED PARTICLES

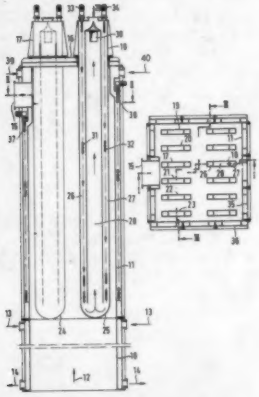
Friedrich Megerle, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 31, 1980, Ser. No. 202,483

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1979, 2944581

Int. Cl.[3] F28G *3/12, 7/00*

U.S. Cl. 165—95 2 Claims



1. A cooler for cooling a hot gas stream containing suspended finely divided particles comprising:

a large flow housing,

means for introducing said hot gas stream at the base of said large flow housing,

a plurality of fluid circulating tubular cooling elements of rectangular cross section supported in said flow housing with their major axes vertical and means defining inner and outer passages of substantially rectangular cross-section, said cooling elements being supported in depending relation within said large flow housing and having closed lower ends,

means for circulating a cooling fluid through said cooling elements into heat exchange relationship with said hot gas stream surrounding said cooling elements, said hot gas stream being passed through a substantially larger cross-sectional area than occupied by said cooling elements, and

cleaning means including freely oscillatable free-hanging devices positioned and located inside said cooling elements and in said outer passages in depending relation terminating short of said closed lower ends and arranged to impact said cooling elements to dislodge particles adhering externally thereto, and

rotary drive means for rotating said cleaning elements within said cooling elements.

4,412,584

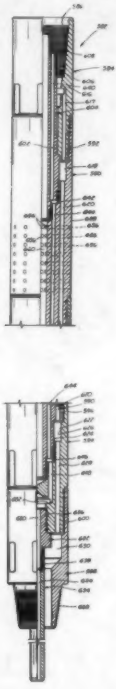
DOWNHOLE TOOL INTAKE PORT ASSEMBLY

John T. Brandell, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 255,252, Apr. 17, 1981, Pat. No. 4,366,862, which is a continuation of Ser. No. 204,057, Nov. 4, 1980, Pat. No. 4,372,387, and Ser. No. 204,058, Nov. 4, 1980, Pat. No. 4,386,655, which is a division of Ser. No. 57,093, Jul. 12, 1979, Pat. No. 4,246,964. This application Aug. 26, 1982, Ser. No. 411,728

Int. Cl.[3] E21B *33/124, 33/127, 49/08*

U.S. Cl. 166—169 4 Claims



1. An intake port assembly, comprising:

a top port assembly adapter having an internally threaded portion for threadedly connecting said intake port assembly to an apparatus located thereabove;

a port adapter having an upper end connected to a lower end of said top port assembly adapter;

a seal mandrel engaging and connected to said top port assembly adapter and having a lower end received in said port adapter;

a spacer connector having an upper end engaging and connected to said port adapter;

a lower port assembly adapter having an upper end connected to said spacer connector;

a flow passage means, disposed in said intake port assembly, for flowing a well fluid from a well bore located about said intake port assembly to said apparatus located above said intake port assembly;

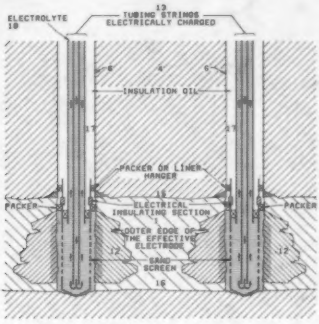
an inflation passage means for communicating an inflation fluid under pressure from an upper end of said intake port assembly to a lower end of said intake port assembly; and

a bypass passage means for communicating well fluid from said upper end of said intake port assembly to said lower end of said intake port assembly.

4,412,585
ELECTROTHERMAL PROCESS FOR RECOVERING HYDROCARBONS

Larry S. Bouck, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed May 3, 1982, Ser. No. 374,582
Int. Cl.³ E21B *36/04, 43/24*
U.S. Cl. 166—248 2 Claims



1. An electrothermal process for recovering hydrocarbon values from an underground hydrocarbon-bearing formation having at least two separated boreholes penetrating the hydrocarbon-bearing formation, comprising the steps of:

(a) placing a heating device in the first borehole,

(b) energizing the device to heat the surrounding formation to a temperature high enough to produce coking of at least a portion of the hydrocarbon-bearing formation, thus forming a coked zone, which, having conductive properties, acts as an electrode,

(c) maintaining the temperature of step (b) for a length of time to obtain a coked zone electrode having an effective radius at least twice that of the borehole,

(d) repeating steps (a-c) in a second borehole,

(e) applying a voltage between the coked zone electrodes of the first and second boreholes, to heat the formation between the boreholes to a temperature at which the hydrocarbon values are mobile, and

(f) recovering hydrocarbon values from one of said boreholes.

4,412,586
METHODS OF INHIBITING THE FLOW OF WATER IN SUBTERRANEAN FORMATIONS

Thomas R. Sifferman, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 121,551, Feb. 14, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,745
Int. Cl.³ E21B *33/138*
U.S. Cl. 166—294 4 Claims

1. A method of reducing the water loss from an aqueous subterranean well formation treating fluid into a water permeable subterranean formation penetrated by a well bore comprising the steps of:

injecting a gelling agent into said formation having the property of forming a highly viscous gel in the presence of water;

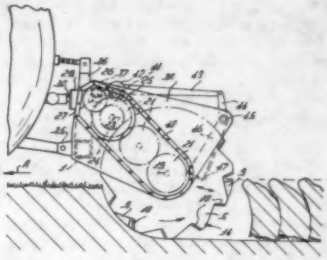
and then introducing said aqueous treating fluid into said well bore whereby water therefrom and water contained in said water permeable subterranean formation forms a highly viscous gel with said gelling agent in said formation which reduces the flow of water thereinto;

wherein said gelling agent is selected from the group consisting of ethoxylated surface active agents and mixtures of such agents.

4,412,587
SOIL WORKING MACHINE

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 27,365, Apr. 5, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,530
Claims priority, application Netherlands, Apr. 12, 1978, 7803852; Apr. 12, 1978, 7803853; Apr. 12, 1978, 7803854; Apr. 12, 1978, 7803855
Int. Cl.³ A01B *9/00*
U.S. Cl. 172—39 2 Claims

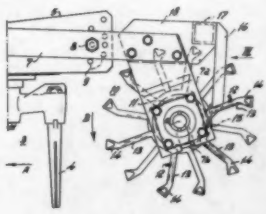


1. A soil working machine comprising a frame and at least one working member rotatably mounted on said frame, driving means connected to rotate said member about a horizontal axis, elongated opposing elements on pairs of supports of said member and a further member being displaceably mounted on said frame to the rear of said working member, said further member comprising a plurality of clod depositing means that project between adjacent elements of the working member, said clod depositing means being movable adjacent surfaces of said elements and co-operating with these elements during operation, said clod depositing means being arranged on arms positioned substantially midway between said supports of the working member, said arms being connected to an eccentric mechanism of the driving means and the respective arms being mounted on a shaft which extends substantially parallel to said axis.

4,412,588
SOIL CULTIVATING IMPLEMENTS

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Aug. 27, 1981, Ser. No. 296,815
Claims priority, application Netherlands, Aug. 29, 1980, 8004888
Int. Cl.³ A01B *33/06, 29/04*
U.S. Cl. 172—68 15 Claims



1. A rotary harrow including a frame and soil working means comprising a plurality of soil working members arranged in a transverse row, said members being rotatable about upwardly extending axes defined by respective shafts journalled in a transverse frame portion, a supporting roller being connected to the frame and positioned at the rear of said soil

working members, said roller being pivotably interconnected to said frame portion via arms with adjusting means to support the frame portion and said arms being adjustable to a number of fixed positions to preselect the working depth of the soil working members, said roller comprising assemblies of outwardly extending projections mounted along the length of an elongated central carrier and said projections comprising integral portions that are angled to one another, said projections terminating in outer free ends which increase in width in substantially the direction of said roller's working direction of movement as they extend outwardly and said ends being bent over laterall from adjacent portions to increase the support of said roller on the ground during operation, said ends also being inclined relative to planes perpendicular to the axis of roller rotation, the end portions of successive projections around the surface of the carrier being bent over laterally in relatively opposite directions.

4,412,589

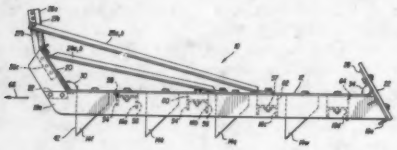
EARTH CLOD PULVERIZER

Thomas E. Francis, 1814 Lakeside Dr., Quinton, Va. 23141

Continuation-in-part of Ser. No. 399,939, Jul. 19, 1982. This application Sep. 29, 1982, Ser. No. 427,363

Int. Cl.³ A01B *27/00*

U.S. Cl. 172—148 **9 Claims**



1. An earth clod pulverizing and earth smoothing implement of a type to be moved across the surface of the earth in a forwardly direction of travel while engaging the earth to break apart relatively large clods near the earth's surface and otherwise prepare the earth's surface for further use, said implement comprising a frame for defining a supporting surface to be approximately parallel to the earth's surface while said implement is in use and for supporting earth-engaging members extending from said supporting surface downwardly, said earth-engaging members including teeth;

the improvement wherein said teeth are wedge-shaped in cross section taken on a plane parallel to the earth's surface, with the cutting edge of each wedge defining a substantially vertical line facing the forwardly direction and with the relatively flat sides of the wedge flaring rearwardly and laterally of the forwardly direction, said teeth having pointed tips at the lower ends of said cutting edges with the trailing sides of said teeth sloping upwardly from said pointed tips toward the backs of said teeth, said pointed tips being directed downwardly into the earth's surface, said teeth being constructed of a cast metal and each tooth being at least 6 inches in vertical length and heavy in weight with cross-sectional sides of said teeth being substantially greater in length than half of the vertical lengths of said teeth;

said earth-engaging means further including lateral, downwardly-extending bars rigidly mounted on said supporting surface positioned behind rows of said teeth, said downwardly extending bars being channel-iron means for providing pairs of front and back adjacent legs, said legs being directed substantially vertically downwardly, the front legs of said leg pairs being shorter than back legs thereof, said channel-iron means being rigidly mounted to said supporting surface on successively larger spacers so that bottom edges of said channel-iron means extend downwardly from the frame deeper than bottom edges of preceding channel-iron means.

4,412,590

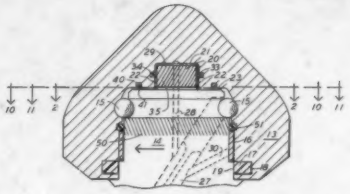
ROCK BIT INTERNAL LUBRICANT PUMP

Jeffery E. Daly, Houston, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Jan. 23, 1981, Ser. No. 227,822

Int. Cl.³ E21B *10/22*

U.S. Cl. 175—229 **4 Claims**



2. A bearing assembly for a rolling cutter drill bit comprising:

a generally cylindrical bearing journal constituting a first bearing member, and having a generally cylindrical shank portion and a generally cylindrical pin portion concentric with but of small diameter than the shank portion at the end of the shank portion, thereby forming an annular shoulder of the journal;

a roller cutter constituting a second bearing member, and having a recess of generally circular section therein receiving the journal;

bearing means between the journal and the roller cutter for rotatably mounting the roller cutter on the journal; and

a lubricant circulation system for circulating grease past the bearing means comprising seal means between the roller cutter and the journal for holding grease in the space therebetween, passaging in the journal having a first channel opening to the space between the journal and the roller cutter generally at one side of said bearing means and a second channel in fluid communication with the first channel and opening to the space between the journal and the roller cutter generally at the opposite side of the bearing means, grooving in the surface of one of said bearing members, and a ring of elastomeric material carried on the other of said bearing members and engageable with said grooving for partially entering the grooving, whereby, upon rotation of the roller cutter on the journal, the ring forces grease to move through said grooving for pumping the grease past the bearing means, through the space between the journal and the roller cutter, and through said channels to circulate the grease.

4,412,591

METHOD AND APPARATUS FOR SELECTING OPERATING MODES OR PARAMETERS IN AN ELECTRICAL SCALE

Arthur Reichmuth, Greifensee, and Willy Kunz, Zurich, both of Switzerland, assignors to Mettler Instruments AG, Greifensee, Switzerland

Filed Nov. 18, 1981, Ser. No. 322,520

Claims priority, application Switzerland, Feb. 6, 1981, 802/81

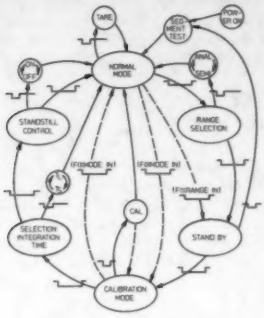
Int. Cl.³ G01G *23/22, 13/14;* **G06F** *15/20*

U.S. Cl. 177—1 **7 Claims**

1. Method for operator-controlled selection of one of a plurality of operating modes available in an electrical scale having a single selector element, comprising the steps of

selecting each of said operating modes in sequence and furnishing a corresponding mode identification signal to

said operator during continuous activation by said operator of said single selector element; and



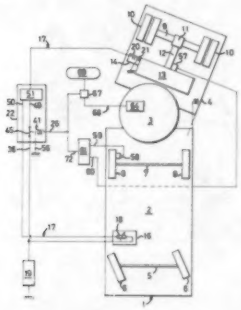
wherein said scale subsequently operates in accordance with the mode present when said operator releases said single selector element.

4,412,592

ARRANGEMENT FOR LIMITING UNCONTROLLED ARTICULATION MOVEMENTS AT A PIVOT BETWEEN VEHICLE UNITS

Hans I. Bergman, and Björn D. Nyman, both of Katrineholm, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Jun. 30, 1981, Ser. No. 279,012
Claims priority, application Sweden, Jul. 3, 1980, 8004927
Int. Cl.³ B62D *53/00*
U.S. Cl. 180—14 A **5 Claims**



1. An arrangement in articulated vehicles for limiting uncontrolled articulation movements between a leading vehicle unit and a trailing vehicle unit articulatedly connected thereto and equipped with driving wheels which are driven by means of a driving unit, characterized in

that at least one transducer is adapted to sense instantaneous speed of at least one driving wheel on the trailing vehicle unit and to send a signal corresponding to said speed to a comparator circuit where the transducer signal is compared with a reference signal representing a normal value for the wheel speed at the instantaneous vehicle speed, and

that another transducer is adapted to sense instantaneous speed on at least one free-rolling vehicle wheel on the leading vehicle unit and to send a signal corresponding thereto to the comparator circuit for constituting the reference signal, the comparator circuit being adapted to give, if the difference between the instantaneous wheel speed signal and the reference signal exceeds a predetermined value, an outlet signal to at least one power control means for the driving unit which apportions transmittable force to the driving wheels in response to said signal, and/or to at least one regulating means regulating mechanical means directly affecting the articulation movement in response to said signal.

4,412,593

STRUCTURE FOR SUPPORTING AUTOMOBILE HORN

Toshiju Taira, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 22, 1981, Ser. No. 227,245
Claims priority, application Japan, Jan. 24, 1980, 55-6606
Int. Cl.³ B60Q *5/00*
U.S. Cl. 180—68 P **3 Claims**

1. A structure for supporting an automotive horn having a circular peripheral flange to an automotive vehicle provided with a synthetic resin radiator grille having a rear side portion, comprising:

an annular synthetic resin frame integrally incorporated with said radiator grille at said rear side portion and defining a rearwardly facing annular recess for receiving the peripheral flange of the horn;

a cushioning member disposed in said recess and having a radially-inwardly-facing annular groove for receiving the peripheral flange of the horn; and

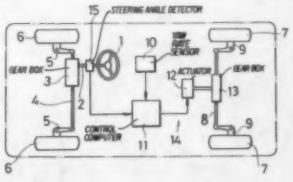
an annular locking member attachable to said frame to retain said member and the horn in said recess.

4,412,594

STEERING SYSTEM FOR MOTOR VEHICLES

Yoshimi Furukawa, Tokyo, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,070
Claims priority, application Japan, Aug. 27, 1980, 55-118101; Sep. 2, 1980, 55-121586; Oct. 20, 1980, 55-146571
Int. Cl.³ B62D *5/06*
U.S. Cl. 180—140 **7 Claims**



1. A steering system for a motor vehicle having rearward steered wheels, comprising:

a sensor for sensing at least a turning motion of the vehicle;

drive means responsive to a signal from said sensor for steering the rearward wheels; and

wherein the steered angle ratio γ of the rearward wheels to forward wheels of the motor vehicle is selected to be in the range of $0<\gamma\leqq 0.6$ when the vehicle is moving at a

speed of 80 km/h or higher, so as to provide optimal steering operation characteristics.

4,412,595

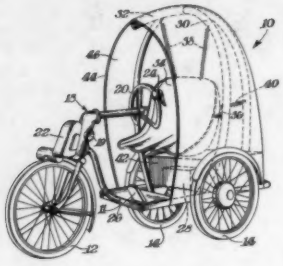
THREE WHEELED VEHICLE

Augustus B. Kinzel, 1738 Castellana Rd., La Jolla, Calif. 92037

Filed Apr. 10, 1981, Ser. No. 253,076

Int. Cl.³ B60R *21/10*

U.S. Cl. 180—211 **11 Claims**



1. In a motor powered vehicle having a body with a plurality of wheels mounted to said body and with power driving means associated with at least one of the wheels for imparting motion to the vehicle and with a steering mechanism associated with the wheels for steering the vehicle and with a seat disposed in back of the steering mechanism, the improvement being a vertical transverse roll bar extending from one side of said body to the other perpendicular to the longitudinal axis of said body forward of and parallel to its rear axle, a vertical longitudinal roll bar extending from the back of said body and secured to said transverse roll bar midway thereof and perpendicular to said transverse roll bar, said seat being suspended from said roll bars in the plane of said transverse roll bar by spring means, said spring means including a back spring secured to the back of said seat and secured to said longitudinal roll bar rearward of said seat.

4,412,596

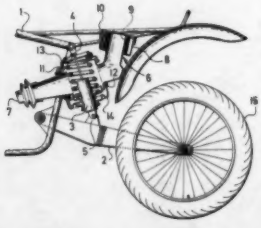
SPRING SUSPENSION FOR THE BACK WHEEL OF A MOTORCYCLE

Frantisek Pudil, and Jaromir Trhlik, both of Strakonice, Czechoslovakia, assignors to Ceske zavody motocykove, narodni podnik, Strakonice, Czechoslovakia

Filed Aug. 14, 1981, Ser. No. 292,734

Int. Cl.³ B62K *25/28*

U.S. Cl. 180—227 **4 Claims**



1. A springing and damping arrangement for the back wheel of a motorcycle provided with a back swinging fork for the mounting of the rear wheel thereof, comprising a springing and damping member disposed between the back swinging fork and the frame of the motorcycle, the springing and damping member passing through a part of an enclosed air intake suction area for the engine between a filter element at the intake end thereof and a discharge branch for connecting a carburetor for the engine thereto, and flexible means sealing the respective ends of the springing and damping member at the motorcycle frame and the back swinging fork thereof to the respective portions of the means which encloses the suction area for the engine.

4,412,597

ENGINE SUPPORT STRUCTURE FOR MOTORCYCLES

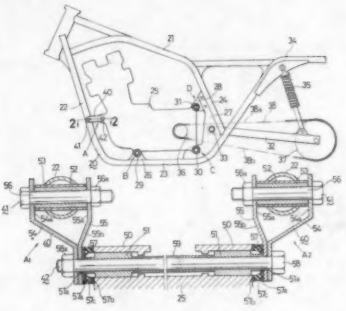
Yasuaki Aiba, Sakado, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1981, Ser. No. 301,274

Claims priority, application Japan, Sep. 22, 1980, 55-132072; Oct. 24, 1980, 55-149037; Oct. 28, 1980, 55-150967

Int. Cl.³ B60K *5/12*

U.S. Cl. 180—228 **25 Claims**



1. In a motorcycle of chain drive type comprising a frame, an engine, coupling means attaching the engine to the frame at a plurality of locations; a chain and a drive sprocket for driving a drive wheel of the motorcycle, said chain transmitting output power from the engine to the drive sprocket, the improvement wherein said coupling means includes at least at one of said plurality of locations, a link coupling coupled to said frame and engine for pivotal movement in a vertical plane, said frame including a down tube portion at the front thereof, said link coupling having a front end pivotably connected to said down tube portion and a rear end pivotably connected to said engine, said down tube portion including a pair of left and right tubes, said link coupling including a pair of substantially parallel link means associated with each of said tubes.

4,412,598

PERSONNEL TRANSFER APPARATUS AND METHOD

Peter M. Kimon, Mendham, N.J., and Yves Bertrand, Paris, France, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 227,708, Jan. 23, 1981. This application Apr. 28, 1982, Ser. No. 372,651

Int. Cl.³ B65G *67/58;* **E04G** *3/10;* **B66D** *1/48*

U.S. Cl. 182—19 **22 Claims**

1. A personnel transfer system, comprising a personnel carrier;

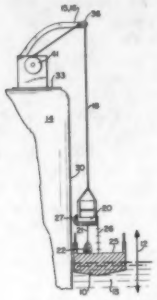
a first means associated with said personnel carrier for operating said personnel carrier in a substantially motion balanced mode when said carrier is disposed upon a launch, wherein said personnel carrier will follow the fluctuating motion of said launch as it moves up and down in the sea;

second means associated with said personnel carrier for operating said personnel carrier in a hoisting mode for lowering or lifting said personnel carrier;

switching means associated with said first means and said second means for switching said personnel carrier between

said substantially motion balanced mode and said hoisting mode; and

said first means including means extending between the personnel carrier and the launch for applying an increased downward load on said personnel carrier when said personnel carrier assumes a position greater than desired above said launch, and to remove said increased downward load when said personnel carrier assumes the desired position above said launch.



4,412,599

LADDER ATTACHMENT

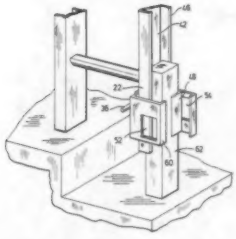
Edward McCrudden, 311 Stonechurch Rd., E., Hamilton, Ontario, Canada L9B 1B1, and Frank Shandalan, Hamilton, Canada, assignors to Edward McCrudden, Hamilton, Canada

Filed Mar. 22, 1982, Ser. No. 360,155

Claims priority, application Canada, Feb. 12, 1982, 396148

Int. Cl.³ E06C *7/44, 7/48*

U.S. Cl. 182—201 **10 Claims**



1. A ladder attachment for securement to the stile or leg of a ladder comprising, in combination, a channel having a web of adjustable width and side walls substantially perpendicular to the web, a reversible angle having securing means for connecting one flange of the angle to the interior of one of said side walls whereby the other flange of said angle is upstanding from said side wall either towards or away from said web relative to the securing means to receive a stile of a ladder between said angle flange and the channel web, means extending through the channel web for biasing the ladder stile away from the channel web, an opening formed in each of the channel side walls for receiving an elongated member therethrough, whereby said elongated member can be inserted through said channel wall openings as a standoff or inserted between a ladder leg and an angle flange as a ladder leg extension and the ladder leg secured to the elongated member by biasing the ladder leg away from the channel web.

4,412,600

HYDRAULIC ELEVATOR

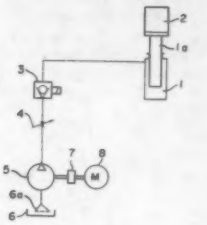
Takuzo Ito; Tadashi Suzuki, and Tatsuro Miyake, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1981, Ser. No. 247,716

Claims priority, application Japan, Mar. 26, 1980, 55-38782

Int. Cl.³ B66B *11/04*

U.S. Cl. 187—17 **5 Claims**



1. A hydraulic elevator comprising:

a car;

hydraulic means coupled to the car for raising and lowering the car using a hydraulic fluid;

a hydraulic pump for supplying the hydraulic fluid to the hydraulic means during raising of the car and for discharging the hydraulic fluid from the cylinder therethrough during lowering of the car;

a motor coupled to the hydraulic pump, said motor positively rotated during raising of the car and reversely rotated during lowering of the car;

flow rate control means connected between the hydraulic pump and the hydraulic means for controlling a flow rate of the hydraulic fluid flowing between the pump and the hydraulic means; and

one-way clutch means connected between the motor and the pump for transmitting a positive driving force of the motor to the pump during raising of the car, and for transmitting a reverse rotating force from the pump to the motor when the revolution speed of the pump exceeds the synchronous speed of the reverse rotation of the motor during lowering of the car, whereby the motor is utilized as a dynamo to apply regenerative braking force to the pump.

4,412,601

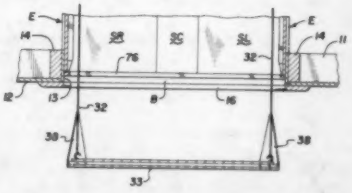
ELEVATOR STORAGE SYSTEM

Gary D. Cooper, 3720 Danbury Dr., Arlington, Tex. 76016

Filed Apr. 17, 1981, Ser. No. 255,211

Int. Cl.³ B66B *11/04*

U.S. Cl. 187—27 **13 Claims**



1. An elevator storage system, for use in association with a ceiling structure, comprising

a storage chamber defined by a ceiling entry opening and overlying above-ceiling space;

an elevator unit, for normal disposition within said storage chamber, comprising an upper transverse support member, a base platform defining a closure for said ceiling opening, and suspension members connected between said support member and said base platform;

an elevating mechanism comprising hoist means disposed in said chamber including at least one lift cable having its lower end connected to said support member, and means for actuating said hoist means to lower and raise said elevator unit;

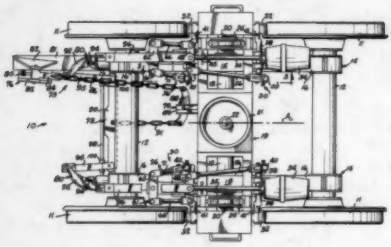
said base platform having corner guides mounted on peripherally spaced corners thereof; said corner guides extending upwardly from said base platform, and providing upwardly and inwardly inclined, outward facing camming surfaces for engaging confronting inward facing surfaces of said ceiling opening to guide said base platform into said ceiling opening.

4,412,602

BRAKING SYSTEM FOR RAILWAY TRUCK

William T. Beatty, Oakwood, Ga., assignor to Rail-Or-Trail Corp., Gainesville, Ga.

Filed Sep. 16, 1981, Ser. No. 302,954
Int. Cl.³ B61A *13/24*
U.S. Cl. 188—53 **4 Claims**



1. A railway truck for a railway car body including

a pair of spaced apart side frames, each of said frames including a generally horizontally oriented central section and a pair of upwardly angled end sections integral with opposite ends of said central section;

a cross tube extending transversely of and pivotally connecting said central sections of said side frames so that said side frames can pivot with respect to each other about said cross tube;

a pair of axles extending transversely of said side frames with each of said axles resiliently connected between the transversely aligned end portions of said side frames so that said axles are located on opposite sides of said cross tube and generally parallel thereto and so that each of said axles can pivot with respect to each other about a horizontal axis parallel to said side frames;

a pair of railway track engaging wheels rotatably mounted on opposite ends of each of said axles outboard of said side frames;

a truck bolster extending transversely over the central sections of side frames to support the car body thereon;

a pair of spring assemblies resiliently connecting said truck bolster to opposite ends of said cross tube inboard of said wheels;

a pair of brake assemblies, one of said brake assemblies mounted on each of the side frames and applying braking forces to said track engaging wheels adjacent that side frame, each of said brake assemblies comprising:

a pair of crank members pivotally mounted on said central section of said side frame mounting said brake assembly on opposite sides of said truck bolster, each of said crank members including a depending pad mounting portion outboard of said side frame extending into the space between said wheels adjacent that side frame and an upstanding drive portion inboard of said side frame and projecting above said truck bolster;

a brake shoe mounted on the pad mounting portion of each of said crank members so that, as said pair of crank members are pivoted in opposite directions, said brake shoes mounted thereon will engage and brake said track engaging wheels adjacent said side frame;

a brake cylinder mounted on said side frame on one side of said truck bolster and including a horizontally extending brake rod projecting therefrom over said truck bolster and having a projecting end located on that side of said truck bolster opposite said brake cylinder;

a horizontally oriented drive link having opposed ends located on that side of said truck bolster opposite said brake cylinder with the projecting end of said brake rod pivotally connected to said drive link intermediate its ends;

a first connecting link extending over said truck bolster and pivotally connecting one end of said drive link to said drive portion projecting above said truck bolster of said crank member on the same side of said truck bolster as said brake cylinder;

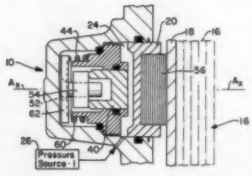
a motion reversing linkage pivotally mounted on said side frame on that side of said truck bolster opposite said brake cylinder, said motion reversing linkage pivotally connecting the other end of said drive link to said drive portion of said crank member on that side of said truck bolster opposite said brake cylinder so that said pair of crank members are pivoted in opposite directions as said brake rod moves said drive link in a first direction to force said brake shoe against the wheels with equal braking force.

4,412,603

DUAL PRESSURE, DUAL PISTON ACTUATOR

Andrea L. Bischoff, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 28, 1981, Ser. No. 334,706
Int. Cl.³ F16D *65/22*
U.S. Cl. 188—106 P **7 Claims**



1. A dual source hydraulic actuator comprising:

a housing defining a primary bore having a closed end and an open end and a central axis;

a first piston slidably and sealingly mounted within the primary bore toward the open end thereof to move axially within the bore;

an insert threadably received within the primary bore and inwardly with respect to the first piston, said insert defining a secondary bore axially aligned with respect to said primary bore;

a second piston slidably and sealingly mounted within the secondary bore to move axially within the bore, said insert and second piston defining a first pressure chamber with respect to the first piston and defining a second pressure chamber with respect to the closed end of the housing;

a first source of hydraulic fluid pressure communicating with the first chamber to provide a pressure force on the first piston; and

a second source of hydraulic fluid pressure communicating

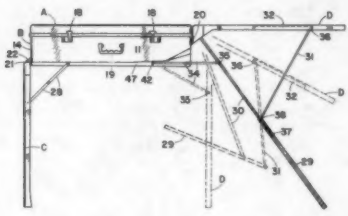
with the second chamber to provide a pressure force on the second piston; said second piston movable only in response to a fluid pressure from the second source to move said second piston into engagement with the first piston, both said pistons thus responding to the second source to provide an output actuating force, said first piston being solely and separately movable in response to the first source of fluid pressure to provide a substantially equal output actuating force.

4,412,604

MULTI-PURPOSE SUITCASE

Harry A. Bell; Howard A. Bell, both of 3534 S. Hudson, Seattle, Wash. 98118, and Harry W. Bell, 5215 Paul Brown Rd., Lakeland, Fla. 33805

Filed Jan. 6, 1982, Ser. No. 337,423
Int. Cl.³ A47B *85/00*; A45G *9/00*
U.S. Cl. 190—1 **5 Claims**



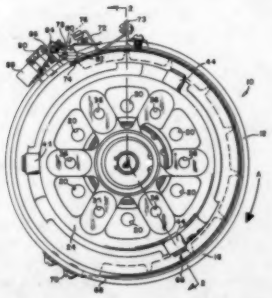
1. A composite, rectangular, molded suitcase, table and ironing board; the suitcase comprising a molded, hollow, rectangular cover and body portion; a molded, truncated V-shaped ironing board hinged to one end of the body portion; a molded, fork-shaped support hinged to the other end of the body portion and receiving the truncated V-shaped ironing board to form a smooth-surface rectangular bottom; the four corners of the composite suitcase, table and ironing board being recessed inwardly in the depth dimension.

4,412,605

ENGINE FAN CLUTCH

Brian C. Deem, Avon Lake, and Richard J. Reitz, Amherst, both of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 22, 1980, Ser. No. 218,902
Int. Cl.³ F16D *43/25*, *43/04*
U.S. Cl. 192—82 T **13 Claims**



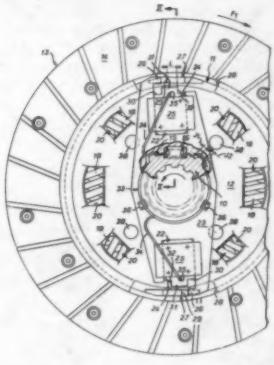
1. In a clutch, a pair of relatively rotatable coaxial members comprising a driving member and a driven member, said driven member including a pair of axially extensible portions responsive to relative rotation between said portions to effect extension thereof to drivingly engage said members by frictionally engaging one of said portions with said driving member, a flexible elongate belt having a free end and an attached end, means securing said attached end to said driving member for preventing relative movement between the attached end and said driving member, a friction surface carried by one of said portions for engagement by said belt, yieldable means engaging a section of said belt adjacent the free end thereof to hold said section into frictional engagement with said friction surface, said yieldable means yielding to movement of said section of said belt against said yieldable means due to centrifugal forces on said belt generated by rotation of said driving member above a predetermined speed, the portion of said belt between said section and said attached end flexing in response to relative movement between said section and said attached end when the latter is urged against said friction surface whereby said portion of said belt is also forced into frictional engagement with said friction surface as the clutch is engaged, and temperature responsive means carried by the driving member for engaging said section of said belt to hold the latter in frictional engagement with said friction surface when the temperature sensed by said temperature responsive means is above a predetermined level.

4,412,606

TORSION DAMPER DEVICE FOR AUTOMOTIVE VEHICLE CLUTCH FRICTION DISC

Pierre Loizeau, Ville d'Avray, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Feb. 21, 1980, Ser. No. 123,509
Claims priority, application France, Feb. 23, 1979, 79 04719
Int. Cl.³ F16D *3/14*
U.S. Cl. 192—106.2 **21 Claims**



1. Torsion damping device, particularly a clutch plate, of the type comprising at least two coaxial parts mounted for rotation relative to each other within limits of predetermined angular displacement counter to a first circumferentially acting elastic means adapted to act circumferentially therebetween for at least one range of said angular displacement, at least one locking element sensitive to centrifugal force counter to return means and reversibly movable because an inoperative standby position for permitting freedom of action of said first circumferentially acting elastic means and an operative position, above a predetermined speed of rotation associated with said return means for producing a positive circumferential abutment of one of said parts against the other of said parts for at least one of the directions of rotation, and thereby rendering said first circumferentially acting elastic means inoperative at least for a portion of said range of angular displacement.

4,412,607

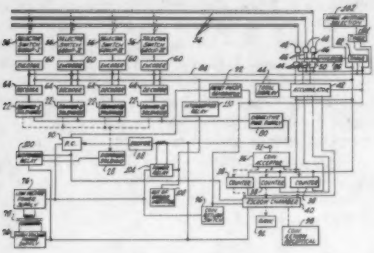
VENDING MACHINE WITH IMPROVED MEANS FOR DISPENSING PRODUCTS AT A PREDETERMINED PRICE

Robert J. Collins, Rte. 1, Box 60D, Culver, Oreg. 97734, and Erich F. Feigl, 1315 Granville Ave., Los Angeles, Calif. 90049

Continuation of Ser. No. 255,170, Apr. 17, 1981, abandoned, which is a continuation of Ser. No. 48,046, Jun. 13, 1979, abandoned. This application Mar. 18, 1982, Ser. No. 359,471

Int. Cl.³ G07F *9/04*

U.S. Cl. 194—1 D **13 Claims**



1. A vending machine comprising:

at least one receptacle for storing a plurality of articles to be vended;

article-releasing means for releasing said articles sequentially upon actuation thereof;

a bank chamber for storing tender;

escrow chamber means forr temporarily holding tender accepted by said machine and for supplying said tender to said bank chamber upon actuation thereof; and

article-sensing means for sensing an article that has been released by said article-releasing means and for actuating said escrow chamber in respons thereto, said article-sensing means comprising exciter means for producing a radiant energy beam and means for detecting said beam; and

exciter sensing means for sensing whether said exciter means is operative to prevent actuation of said article-releasing means if said exciter means becomes inoperative.

4,412,608

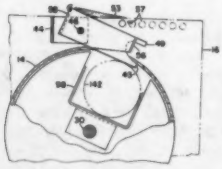
COIN DISPENSING MACHINE FOR NON-FERROUS BEVERAGE CANS

Arthur H. Kaspar; Johnny J. Valis; Weldon J. Aschenbeck, all of Shiner, Tex.; Josephine A. Kaspar (executrix of said Arthur H. Kaspar, deceased), and Don G. Kaspar (executor of said Arthur H. Kaspar, deceased), assignors to Kaspar Wire Works, Inc., Shiner, Tex.

Filed Jul. 31, 1981, Ser. No. 288,793

Int. Cl.³ G07F *7/06*

U.S. Cl. 194—4 D **6 Claims**



1. A machine for dispensing coins in response to receipt and checking of non-ferrous cans comprising:

housing having a can opening from outside said housing to inside said housing to receive said non-ferrous cans therethrough;

cylinder means rotatably carried in said housing on a shaft means extending from said housing to form a handle, said cylinder means having a carriage for receiving said non-ferrous can through said can opening and rotating said non-ferrous can therewith via said handle;

check means for checking said non-ferrous can during rotation of said cylinder means to insure defined characteristics of said non-ferrous can;

plate means rotated by said shaft means, said plate means engaging said check means to stop rotation of said cylinder means if said defined characteristics are not met;

magnetic means pivotally mounted on said housing adjacent said cylinder means, said magnetic means checking articles inserted in said can opening and rotated adjacent thereto to determine if said article is ferrous and if so moving said magnetic means toward said article;

a partial shell around said cylinder means, said partial shell having a non-metallic sheet between said magnetic means and said cylinder means;

linkage means operatively connecting said magnetic means through said pivotal amount of said magnetic means to said plate means to prevent said rotation of said plate means and said cylinder means if said article is ferrous;

coin dispensing means operated by rotation of said shaft for dispensing said coins upon a substantially complete rotation of said cylinder means; and

can receiving means operated by rotation of said shaft receiving said non-ferrous can upon a substantially complete rotation of said cylinder means.

4,412,609

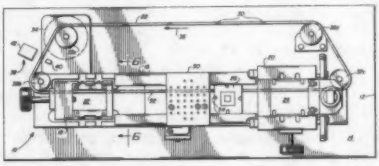
TRANSPORT SYSTEM

Edmund H. Schieve, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jun. 29, 1981, Ser. No. 278,255

Int. Cl.³ B65G *43/00*

U.S. Cl. 198—341 **6 Claims**



1. A transport system for transporting fixtures serially from a fixture transferor station to a fixture transferee station, comprising:

fixture guide rail means interconnecting the transferor station and the transferee station, said rail means having means forming a chain guide recess extending from the transferor station to the transferee station;

a plurality of sprockets;

a continuous plastic timing chain cable having transverse links mounted on said sprockets, said sprockets being positioned relative to said guide rail means so that the timing chain is positioned in the chain guide recess of the guide rail means with the transverse links being substantially vertical;

means for causing one of said sprockets to rotate in a given direction;

drive pins having a head and a shank mounted in selected ones of the links of the chain by inserting the shanks of the drive pins into the selected ones of said links, the heads of the pins projecting from the side of said chain so as to project beyond the chain guide recess to initially contact a fixture positioned in the transferor station; the distance between drive pins being substantially constant; and

control means for controlling said means for causing one of said sprockets to rotate in a given direction.

4,412,610

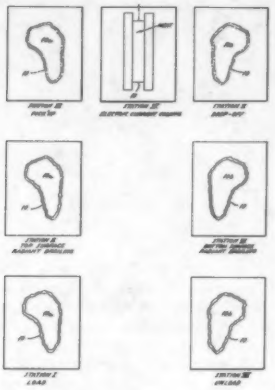
MEAT COOKING APPARATUS AND METHOD

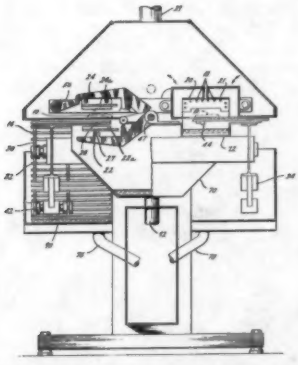
David B. Flavan, Jr.; Merrill M. E. Jenkins, Sr., both of St. Louis; James S. White, Webster Groves, and James E. Pate, Fenton, all of Mo., assignors to Three Rivers Development Corporation, St. Charles, Mo.

Division of Ser. No. 42,747, May 29, 1979, Pat. No. 4,244,284. This application Nov. 3, 1980, Ser. No. 203,177

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—403 5 Claims





1. A conveying mechanism for transporting an article comprising:

a first endless conveyor for carrying said article, said first conveyor having a first plurality of cantilevered rods disposed perpendicular to the movement of said first conveyor and secured at their outer ends to a first chain;

a second endless conveyor for carrying said article, said second conveyor having a second plurality of cantilevered rods disposed perpendicular to the movement of said second conveyor and secured at their outer ends to a second chain;

first and second transfer members each having a plurality of fingers disposed perpendicular to the movements of said conveyors and sized and spaced from each other to pass between said cantilevered rods, said first and second transfer members adapted to engage opposite surfaces of said article;

means for mounting said first and second transfer members between said conveyors for pivotal movement between said conveyors through an arc perpendicular to the movements of said conveyors;

and means for driving said conveyors and said transfer members at prescribed times.

4,412,611

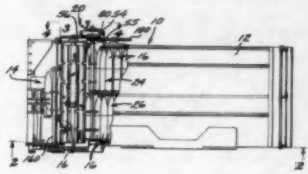
TRANSPORT MECHANISM

Michael D. Golden, Costa Mesa, Calif., assignor to Western Design Corporation, Irvine, Calif.

Filed Oct. 26, 1981, Ser. No. 314,666

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—450 15 Claims



1. For use in a material handling system for transporting a plurality of like objects from a storage compartment thereof to a predetermined location, a transport mechanism comprising in combination,

means forming a plurality of inlet openings and one outlet opening, each of which is adapted to sequentially pass a plurality of said objects,

means operatively interposed between said inlet openings and said outlet opening including a spacing unit having a rotatable shaft for each inlet opening individually adapted to retain said objects as said shafts are rotated, and a variable speed mechanism for varying the angular speed of each shaft to thereby vary the space between adjacent objects thereon for interleaving said objects from said inlet openings to form a single row of objects at said outlet opening.

4,412,612

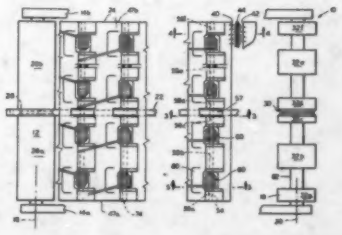
DRIVE BELT CONNECTION FOR AN AGRICULTURAL PICKUP DEVICE

LaVern L. Ackerman, Bismarck, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 914,247, Jun. 9, 1978, abandoned. This application Dec. 20, 1979, Ser. No. 109,706

Int. Cl.³ B65G *15/44*

U.S. Cl. 198—697 8 Claims



1. An agricultural pickup device of the type having a pair of spaced-apart rollers, each of said rollers having a recessed portion, a flexible drive belt drivingly engaging said rollers at said recessed portions, an endless conveyor apron being disposed over said drive belt and around said rollers, said apron having a plurality of raised portions arranged in transverse rows, each of said rows of raised portions having a coaxial bore in each of said respective raised portions, a plurality of pins,

each of said pins threaded through respective coaxial bores of a respective row of said raised portions, said apron having at least one apron opening intermediate respective raised portions in each of said rows of said raised portions, a material-engaging element positioned in each of said apron openings and mounted on respective pins, wherein the improvement comprises said apron having lug openings, each of said lug openings intermediate respective raised portions in a respective row of said raised portions, said drive belt having an outwardly extending lug through each of said lug openings, each of said lugs having an aperture coaxial with respective coaxial bores of a respective row of said raised portions, a respective pin threaded through a respective aperture, whereby said pins used to connect said material-engaging elements to said apron also connect said drive belt to said apron so that said drive belt and said apron connection allows individual flexing of both said drive belt and said apron as they bend over said rollers at different pitch radii.

4,412,613

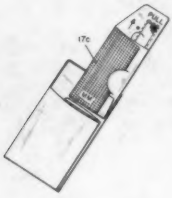
MICROSURGICAL FOAM NEEDLE CONTROL PACKAGE

Robert J. Kubas, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 215,598, Dec. 12, 1980. This application Oct. 19, 1981, Ser. No. 311,857

Int. Cl.³ A61L *17/02*

U.S. Cl. 206—63.3 **5 Claims**



1. A direct dispensing surgical suture package comprising a center panel; a foam receptacle affixed to said panel; a single-armed surgical suture with the needle engaged in the receptacle; and at least a first flap adjacent and placed onto said panel allowing said receptacle to be visible, the improvement comprising a folder containing a second center panel and a plurality of side flaps, at least two adjacent side flaps of said folder being folded to form a pocket, said suture package placed into said pocket and the remaining side flaps of said folder being folded, whereby said package can be dispensed from said folder, and a grid on the exterior suture package surface whereby said suture can be dispensed from said package by disengaging and then pulling said needle, and said suture can be oriented and measured by placing it on said grid.

4,412,614

THREE PANEL NEEDLED SUTURE HOLDER

Konstantin Ivanov, Edison, and Jack Cascio, Bridgewater, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 16, 1982, Ser. No. 349,427

Int. Cl.³ A61L *17/02*

U.S. Cl. 206—63.3 **10 Claims**

1. An improved retainer for needled surgical sutures comprising:

(a) a center panel;

(b) a pair of side panels;

(c) said center panel being substantially rectangular in shape;

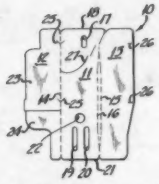
(d) a side panel foldably connected to each of the longitudinal edges of the center panel;

(e) a single aperture located adjacent one transverse edge of said center panel through which a pin may protrude on which the suture may be wound;

(f) at least one aperture located adjacent the opposite transverse edge of said center panel through which a pin may protrude on which the suture may be wound;

(g) one of said side panels being configured so that when it is folded upon the center panel it is substantially coextensive with the center panel in the central portion thereof but does not cover the apertures;

(h) said side panel being sectioned transversely so that the needle of the needled surgical suture may be placed on the center panel adjacent the single aperture and the first section of said side panel folded over on to the center



panel to cover and enclose the needle without covering the aperture, whereby when the suture is wound about the pins protruding from the apertures the initial winding of the suture will hold the needle in place while the suture is being wound about the pins;

(i) the second section of said side panel being foldable over the center panel to contain the lower portion of the wound sutures;

(j) the second side panel being substantially coextensive with the center panel and foldable about the longitudinal edge thereof connecting said side panel to the center panel; and

(k) said folder including locking means to maintain the folded panels in place and maintain the needled surgical suture in the desired configuration.

4,412,615

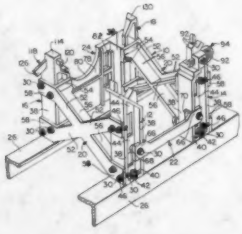
ENGINE CRADLE

David J. Forshee, 11 Misty Morning Dr., Hilton Head Island, S.C. 29228, assignor to David J. Forshee

Filed Apr. 13, 1981, Ser. No. 253,260

Int. Cl.³ B65D *85/68*

U.S. Cl. 206—319 **18 Claims**



1. A plastic engine cradle fully open at its top and bottom sides for securement to a pair of longitudinally extending support rails or a supporting platform or rack of a material handling system comprising

a plurality of integrally molded unitary spaced apart upstanding plastic corner posts,

an integrally molded unitary front transverse plastic bar connected at its lateral distal ends terminating in two adjacent bifurcated flanges disposed in right angle planes to a first pair of said corner posts, an integrally molded

unitary rear plastic yoke plate member connected at its lateral distal ends terminating in two adjacent bifurcated flanges disposed in right angle planes to a second pair of said corner posts,

a pair of integrally molded unitary rigid plastic x-shaped cross members defining the lateral sides of said cradle and connected at their lateral distal ends terminating in two adjacent bifurcated flanges disposed in right angles planes to said pairs of corner posts,

said bifurcated flanges comprising an outwardly facing flange and an inwardly directed flange,

means secured to said inwardly directed flanges and affixed to said front transverse bar, said yoke plate member and said x-shaped cross members reinforcing and/or bracing said inwardly directed flanges against said corner posts,

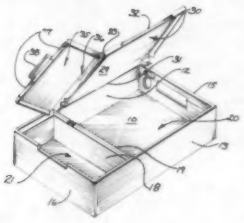
and fastening means removably securing the aforesaid integrally molded unitary plastic components rigidly together into an engine supporting cradle.

4,412,616

MULTICOMPARTMENT EQUIPMENT CASE AND COVER

Paul M. Williams, Minneapolis, Minn., assignor to Williams Sound Corporation, Eden Prairie, Minn.

Filed Oct. 14, 1982, Ser. No. 434,221
Int. Cl.³ B65D *51/18*
U.S. Cl. 206—333 **4 Claims**



1. In an equipment case of the class providing multiple compartments to which periodic access is necessary, the combination, comprising:

a hollow one-piece plastic case including a plurality of compartments, each having an access opening, said access opening including means for latchable receiving a latch on a cover member therefore; and

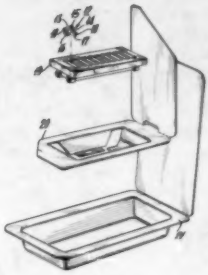
a foldable one-piece plastic cover member including a like plurality of segments shaped and configured to coact with corresponding access openings in said case, and including a latch disposed and shaped to coact with corresponding ones of said means for latchably receiving said latch, one of said segments being hingedly attached to said case by resilient plastic material bridging to said case along one of said access openings and another of said segments being hingedly attached to said one segment by resilient plastic material along an edge of said one segment orthogonal to said case hinged attachment, only said last-identified segment having a lift tab attached thereto for unlatching said segment, thereby to require preferred sequential unlatching and latching of said segments.

4,412,617

LIGATING CLIP PACKAGE

Robert J. Cerwin, Pittstown, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Jul. 20, 1981, Ser. No. 284,413
Int. Cl.³ B65D *85/24*
U.S. Cl. 206—339 **5 Claims**



1. A package comprising:

(a) disposable means for holding a plurality of ligating clips in spaced apart relationship to facilitate dispensing of a clip:

(b) a plurality of sterile, dry, hydrolyzable surgical ligating clips disposed in spaced apart relationship in said disposable holding means, each of said clips having a narrowed resilient hinge portion, said hinge portions being more sensitive to hydrolysis than the remainder of said clip;

(c) absorbing means adjacent to said holding means, said absorbing means having a greater affinity for moisture than any portion of said clip whereby any moisture present in said package, including moisture in the area around each clip, is preferentially absorbed by said absorbing means, said absorbing means having sufficient absorbent capacity to maintain the clips dry and sterile while in the unopened package;

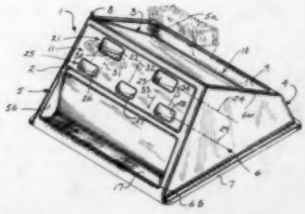
(d) and a moisture impermeable outer wrap disposed in sealing relationship with respect to the disposable holding means, clips, and moisture absorbing means, whereby said initially dry and sterile clips are maintained dry and sterile until the package is opened to maintain the resiliency of the hinge portion of the clips for an extended shelf life period.

4,412,618

TRAY FOR GROOMING INSTRUMENTS

Ruth A. La Conte, 4529 N. Cramer, Whitefish Bay, Wis. 53211

Filed Sep. 29, 1981, Ser. No. 306,603
Int. Cl.³ B65D *1/36, 6/04;* **C82F** *1/70, 3/00*
U.S. Cl. 206—581 **4 Claims**



1. A tray for removably holding grooming instruments, comprising:

a first wall operatively connected to a base and located in a plane inclined with respect to said base, said first wall including an upper portion having a plurality of spaced openings and a lower portion having a trough formed

therein for horizontally receiving a grooming instrument therein,

a second wall located in a plane inclined with respect to said base, said second wall sloping downwardly from the apex of said first wall in a direction opposite from said first wall and including an abutment at the lower end of said second wall to form a recess for horizontally receiving a grooming instrument therein, said second wall further including a pair of opposite end walls extending between said apex and said abutment for enclosing the sides of said recess,

support means providing an elongate tubular compartment associated with each of said openings and extending from the inner surface of said first wall to longitudinally retain a grooming instrument projected lengthwise from said first wall in an inclined position with respect to said base, each of said compartments having a length substantially greater than its width and an open bottom, and

a plurality of side walls supporting said first and second walls.

4,412,619
RECLOSABLE CARRY-CARTON

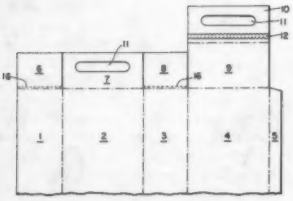
Albert Van Laer, Beveren-Melsele, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 25, 1982, Ser. No. 342,340

Claims priority, application United Kingdom, Jun. 17, 1980, 80-19681

Int. Cl.³ B65D *27/38*

U.S. Cl. 206—611 **2 Claims**



1. A seal-end carton in the form of a sleeve of rectangular cross-section and having alternating face and side panels, said carton provided with an easily opened reclosable end closure with an integrated handle, said end closure comprising two inner top flaps articulated from said side panels along integral score lines and having lines of weakness formed adjacent said score lines across substantially the entire width of said inner top flaps, an upright back top flap extending upwardly from one of said face panels and having a hand hold cut-out therein, an outer top flap articulated from the other of said face panels along an integral score line and having its inner surface adhesively attached to the outer surfaces of said inner top flaps, an extension flap articulated from the distal edge of said outer top flap along a second integral score line and having a cut-out therein corresponding to the hand hold cut-out of said upright back top flap, said extension flap being bent back along said second score line and adhesively joined to said upright back top flap with the hand hold cut-outs in registry, and a tear strip extending substantially across the full width of said extension flap intermediate the hand hold cut-out and said second score line and spaced from said second score line, whereby removal of said tear strip permits access to the carton interior by tearing open said top flaps along said lines of weakness of said inner top flaps while leaving a portion of said extension flap articulated from said outer top flap for reclosure of the carton.

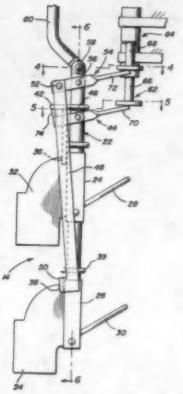
4,412,620
PLURAL HOOK POULTRY GRADING CARRIER SYSTEM

William F. Altenpohl, 1315 Robin Hood Rd., and Paul J. Altenpohl, 704 N. Westchester Dr., both of High Point, N.C. 27260

Filed Mar. 19, 1981, Ser. No. 245,693

Int. Cl.³ B65G *17/20;* **A22C** *21/00*

U.S. Cl. 209—3.1 **10 Claims**



6. A carrier adapted to be suspended from a conveyor comprising an elongated body, a plurality of hooks operatively mounted on the body and projecting laterally therefrom in the same direction, on only one side of the body, a plurality of separate latch elements mounted on the body for independently holding the hooks in latched positions on said one side of the body, and force transfer means through which latch releasing forces are applied to the latch elements for release of the hooks associated therewith.

4,412,621
MAGAZINE ASSEMBLY FOR HOLDING INFORMATION BEARING CARDS AND THE LIKE

Falk-Jürgen Eichner, Coburg, Fed. Rep. of Germany, assignor to Eichner Organisation KG, Coburg, Fed. Rep. of Germany

Filed Apr. 22, 1981, Ser. No. 256,520

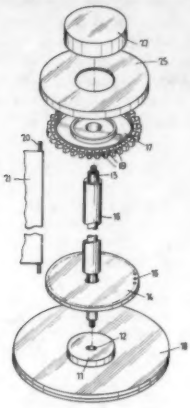
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016178

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—58 **2 Claims**

1. A rotary magazine assembly for holding information bearing cards and the like having support pins attached along one of the sides of the cards, comprising, a vertical axle having a support base, a pair of spaced plates rotatably mounted on said axle, a disc having a central aperture and overlying an upper one of said plates, said plates having a plurality of openings therein spaced along the outer peripheries thereof for the pivotal reception of opposite ends of said support pins, said openings in said plates respectively lying inwardly of said outer peripheries, said upper plates having slots each defined by a pair of diverging walls extending between each of said openings and said outer periphery thereof, each of said openings in said upper plate having a predetermined diametral size, and inner ends of each said pair of diverging walls being spaced apart a distance less than said size to thereby define

snap openings for the reception of upper ends of said pins, said disc having a plurality of projections extending radially in-



wardly into said slots for positive locking said upper ends of said pins in place against unintentional removal.

4,412,622

TELESCOPING STRUT CRANE

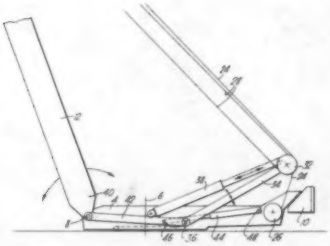
Karl M. Gyomrey, Belmont, England, assignor to Coles Cranes Limited, England

Continuation of Ser. No. 179,616, Aug. 18, 1980, abandoned. This application Sep. 15, 1982, Ser. No. 418,134

Claims priority, application United Kingdom, Aug. 17, 1979, 7928797

Int. Cl.³ B66C *23/42*

U.S. Cl. 212—187 **20 Claims**



1. A vehicle mounted mobile crane comprising:

a variably extendible telescopic jib having at least head and base sections, the foot of said base section releasably pivotally mounted to a first point at a first and forward position on the vehicle;

a swing link pivotally connected at a first end to the foot of said base section and at a second end to a second point at a second position on the vehicle;

means for swinging said swing link and the foot of said base section therewith about said second end to a third and rearward position on the vehicle so as to stow said jib, said foot and first end rising during swinging movement between said first and third positions;

said second position being intermediate said first and third positions;

a derrick mast pivotally mounted at one end at the second position on the vehicle;

pulleys mounted to the top of said head section and to the outer end of said derrick mast;

a fixed length tie rope passed around said pulleys so as to support the jib head a fixed distance from the outer end of the derrick mast; and

luffing means for angularly positioning said derrick mast acting between the mast and vehicle whereby the jib may be luffed when the base section is pivoted at the first position and whereby the mast and jib can be closely stowed when the base section is moved to the third position.

4,412,623

TEAT FEEDING BOTTLE HAVING A PIERCEABLE WALL AND SPIKE OPENING MEANS

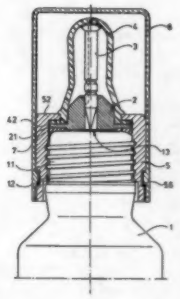
Manfred Schmidt, Butzbacher Pfad 14, D-6365 Rosbach, Fed. Rep. of Germany

Filed Dec. 28, 1981, Ser. No. 334,551

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104861

Int. Cl.³ A61J *9/00, 11/00, 15/00*

U.S. Cl. 215—11 R **9 Claims**



1. In a teat feeding bottle comprising a container, a screw cap, a teat and a spike, said teat having a peripherally extending flange sealingly clamped by the flange of said screw cap against a neck portion of said container, said teat freely extending outwardly from said screw cap, said spike extending to the top of said teat and positioned substantially vertically and the pointed tip of said spike being spaced from a pierceable wall of said container, the improvement characterized by a longitudinal guiding portion for the pointed tip of said spike, said guiding portion being clamped between said pierceable wall and said flange of said screw cap; and a pushbutton-like enlargement of said spike positioned within the interior of said teat and provided on the opposite end from said pointed tip of said spike.

4,412,624

HANGING MEMBER FOR HANGING A CONTAINER IN AN INVERTED POSITION

Nobuyoshi Tanaka, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 2, 1982, Ser. No. 364,643

Claims priority, application Japan, Apr. 3, 1981, 56-48793[U]

Int. Cl.³ B65D *25/22*

U.S. Cl. 215—100 A **20 Claims**

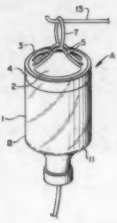
1. A hanger for hanging a container in an inverted position, comprising:

a ring member adapted to be placed on the bottom of the container;

a pair of semi-circular hanger members lying along and spaced from the inner peripheral edge of said ring member and in the plane of said ring member in the non-use condition of said hanger, said semi-circular hanger members

having the ends integrally attached to the inner peripheral edge of said ring member at substantially diametrically opposite points of said ring member; and

a transverse hanger member attached to and extending between substantially the midpoints of said semi-circular hanger members transverse to a line between the points at which said semi-circular hanger members are integrally attached to said ring member, and in the plane of said ring member in the non-use condition of said hanger, all of said members being made of a bendable resin material and the



integral attachments of said semi-circular hanger members to said ring member and said transverse hanger member to said semi-circular hanger members are flexible and permit said members to hinge relative to each other, whereby said semi-circular hanger members can be pivoted upwardly out of the plane of said ring member and said transverse hanger member is looped upwardly for hooking over a laterally extending support member or hook on a stand, wall hook or the like for supporting the container in an inverted position.

4,412,625

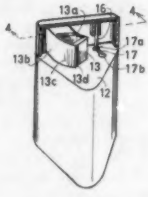
CHILD-PROOF PILL CONTAINER FOR HANDICAPPED

Patricia J. Zander, 508 Brevoort La., Rye, N.Y. 10580

Filed Feb. 16, 1982, Ser. No. 348,678

Int. Cl.³ B65D *43/14, 47/08, 55/02, 83/04*

U.S. Cl. 215—223 **10 Claims**



1. A safety container and cap comprising:

a container component provided with a storage compartment covered by a top with an opening therethrough for dispensing contents of the container;

a cap component provided with a means to seal the opening in the top of the container;

means for securing the cap slidably and rotatably to the top of the container and means for guiding the motion of the cap relative to the container, which motion comprises two discrete steps to uncover the opening of the container, wherein the means for securing the cap to the container comprises: a rotatable member from a first component inserted within a guide portion of a second component, which guide portion permits a lateral motion of the rotatable member followed by a rotational movement of the rotatable member, and the rotatable member comprises a cylindrical shaft protruding from the cap, which shaft is provided with an enlarged end with an abrupt increase in diameter adjacent to the shaft and a tapered tip, and wherein the guide portion comprises providing the top of the container with an elongated slot having a circular enlargement of the slot at least at one end of the slot, wherein the slot width is narrower than the diameter of the protrusion, and the circular enlargement is approximately equal to the diameter of the shaft to admit the shaft without release and permit rotation of the shaft therein.

4,412,626

FREIGHT CONTAINER WITH MEANS FOR LOCKING THE TENSIONING RINGS

Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Gerhard KG, Weitefeld, Fed. Rep. of Germany

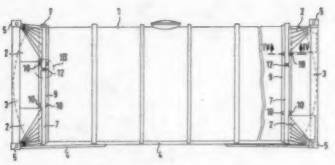
Filed Sep. 11, 1981, Ser. No. 301,135

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034512

The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

Int. Cl.³ B65D *88/06, 88/12, 90/00*

U.S. Cl. 220—1.5 **19 Claims**



1. A freight container for fluids, comprising

(a) an outer frame,

(b) a substantially cylindrical tank,

(c) a pair of tensioning rings surrounding said tank near both ends thereof, each ring being composed in the peripheral direction of said tank of at least two sections,

(d) means for interconnecting said sections of each said ring to tension the same about said tank,

(e) metal pieces welded to said tank for locking each said ring in both axial directions of said tank, and

(f) saddle pieces connected to said frame at corner regions thereof, each saddle piece having a border portion welded to a respective one of said rings.

4,412,627

DRAWN AND IRONED CAN BODY

Timothy J. Houghton; Carl J. Szwargulski, Jr.; Jerry A. Bentrup, all of St. Louis County, and Donald L. Smidt, Jefferson County, all of Mo., assignors to Metal Container Corporation, St. Louis, Mo.

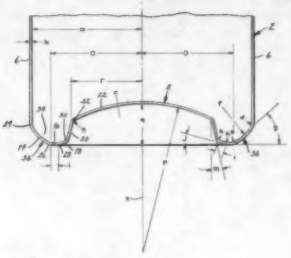
Filed May 29, 1981, Ser. No. 268,321

Int. Cl.³ B65D *6/02, 7/42*

U.S. Cl. 220—66 **22 Claims**

21. A metal can body that is capable of undergoing a controlled deformation when subjected to elevated internal pressures, said can body comprising: a cylindrical side wall and an end wall connected to the side wall and closing one end of the can body, the end wall including an annular peripheral section that extends downwardly from the side wall and inwardly toward the center axis of the can body, a circular, dome-shaped center section located inwardly from the peripheral section with its concave surface being presented downwardly, and at least two additional sections located between the peripheral section and the center section and serving to connect the peripheral section and the center section, one of the additional sections being connected to the peripheral section and extending generally inwardly therefrom, said one additional section being substantially the frustum of a shallow cone that is inclined upwardly away from the peripheral section, the width of said one additional section being substantially less than the

radius of the dome-shaped center section, another of the additional sections being oriented in a generally upright disposition and being connected to the center section at a band in the metal of the end wall, with the bend being located substantially above said one additional section and the domed-shaped center section being located entirely above the two additional sections, said other additional section extending generally downwardly from the center section and being disposed at a steep



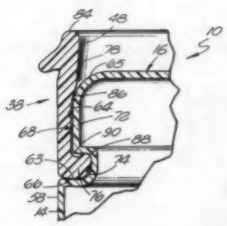
angle with respect to said one additional section, the can body when the end wall is subjected to elevated internal pressures being adapted to permanently yield along the periphery of said one additional section such that the inclination of the one additional section changes and the one additional section becomes a downwardly and inwardly directed continuation of the peripheral section, whereby the other additional section and the dome-shaped center section shift downwardly to increase the volume of the can body.

4,412,628

THERMOPLASTIC DRUM APPARATUS

Floyd A. Whitney, Riverside, Calif., assignor to Born Free Plastics, Inc., Gardena, Calif.

Filed Apr. 17, 1981, Ser. No. 255,141
Int. Cl.³ B65D *1/46, 6/36, 25/22*
U.S. Cl. 220—71 **2 Claims**



1. A thermoplastic drum comprising:

a performed drum body having a top, a bottom, and a cylindrical sidewall between the top and bottom, the sidewall having a radially recessed region adjacent the top of the drum and a cylindrical indenture between the recessed region and the remaining non-recessed portion of the sidewall, the recessed region being radially recessed by a first distance; and

a rim attached to the recessed region of the drum body, said rim having a cylindrical wall, a grasping beak projecting away from the cylindrical wall about its circumference and a protuberance projecting inwardly from the cylindrical wall into the indenture, the cylindrical wall having a thickness substantially the same as the first distance so that the cylindrical wall of the rim is in colinear alignment with the non-recessed portion of the sidewall, the inwardly projecting protuberance of the rim having an annular, upwardly projecting lip extending from the protuberance for modifying the cross-sectional shape of the protuberance whereby an enclosed annular space is formed between the recessed region of the sidewall and the protuberance adjacent to the lip.

4,412,629

NON-SPILL DRINK-THROUGH LID

William A. Dart, and Kenneth B. Dart, both of Okemos, Mich., assignors to Dart Container Corporation, Mason, Mich.

Filed Nov. 4, 1981, Ser. No. 317,789
Int. Cl.³ A47G *19/22*
U.S. Cl. 220—90.4 **3 Claims**

1. A non-spill drink-through lid for use on a drinking cup comprising:

a lid having a central cover portion, said lid adapted to matingly engage the upper peripheral edge of a drinking cup so as to selectively maintain said lid in a covering relationship on said cup;

a tab portion defined in said central cover portion of said lid, said tab portion selectively depressible so as to provide a drinking opening in said lid, said tab portion biased so as to selectively return to its normally closed positon within the plane of said central cover portion upon removal of pressure thereagainst; and

a hollow lip-engaging buttress member integrally formed in said tab portion, said buttress member configured to provide increased heat-dissipating surfaces thereon so as to insulatively engage the upper lip of a user drinking from said cup through said drinking opening in said lid, said buttress member having a corrugated configuration comprising a plurality of arcuate narrow spaced-apart ridges having corresponding arcuate grooves positioned therebetween so as to insulatively engage the upper lip of a user drinking from said cup through said drinking opening in said lid, said ridges comprising narrow raised portions which define corresponding pockets on the bottom surfaces thereof so as to provide increased heat-dissipating surfaces on said buttress member so as to insulatively engage the upper lip of a user drinking from said cup through said drinking opening in said lid.

4,412,630

CONTAINER CLOSURE ALIGNMENT DEVICE

Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Mar. 9, 1982, Ser. No. 356,601
Int. Cl.³ B65D *43/04, 43/08*
U.S. Cl. 220—353 **8 Claims**

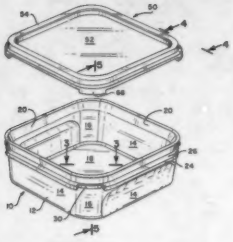
1. A container having a wall structure and a bottom wall at one end of said wall structure;

said wall structure including at least two sidewalls joined by at least two curved walls;

said wall structure further including a sealing rim positioned at the end of the container opposite the bottom wall;

a cover having a central portion and a sealing member positioned about said central portion and adapted to mate with said sealing rim;

alignment means on said cover and said side wall structure cooperating to align the sealing member with respect to



the sealing rim such that the cover can be properly fitted onto the container.

4,412,631

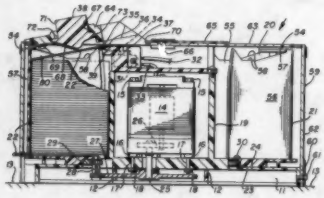
CAROUSEL CARD DISPENSER

Floyd H. Haker, 6546 Linden La., Dallas, Tex. 75230

Filed Sep. 17, 1981, Ser. No. 303,293

Int. Cl.³ A47F *1/10*

U.S. Cl. 221—66 **16 Claims**



1. In a dispenser for the controlled one at a time dispensing of cards from a quantity of cards stored in the dispenser, to which a card must be returned to activate the dispensing of the next successive card to be dispensed: card storage means; card dispense extending means for extending one card at a time from said card storage means for removal by an operator and use in a repetative use operational cycle; card to storage insertion means; and dispenser actuating means positioned for activation with a card reinserted in said card to storage insertion means; wherein said card storage means includes a card storage compartment; and said card dispense extending means includes a card extend drive cam, and drive means for driving said storage compartment and said card extend drive cam in relative movement for cam drive dispense extending a card from said card storage compartment; and wherein said drive means includes electric motor means; and said dispenser actuation means includes a drive means activating switch subject to activation to the on state by each card reinserted in said card to storage insertion means as the card is being moved to a card storage compartment.

4,412,632

SELF-CLEANING VALVE

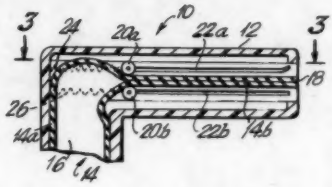
Richard F. Berger, 30 Cold Spring Hills Rd., Huntington, N.Y. 11743; Greg Pardes, 425 E. 58th St., New York, N.Y. 10022, and Bernard R. Gerber, 172-12 133rd Ave., Jamaica, N.Y. 11434

Filed May 28, 1981, Ser. No. 267,876

Int. Cl.³ B05B *11/04*

U.S. Cl. 222—148 **12 Claims**

1. Self-cleaning valve for use at the outlet of a container for dispensing a material from the valve comprising an axially elongated flexible flattenable outlet tube having an inlet end through which the material enters the valve and an outlet end from which the material is dispensed after passing through said outlet tube with the axis of said outlet tube extending in the inlet end-outlet end direction, said outlet tube having an at-rest condition and a dispensing condition, said outlet tube forms a passageway between said inlet end and said outlet end, said passageway in the at-rest condition of said outlet tube is flattened for a portion of the axial length of said tube forming a closure of said passageway blocking flow through said valve, in the dispensing condition the force of the material being displaced from a container through said valve opens the flattened section of said passageway so that the material can flow out of said outlet end, means for maintaining said passageway



in said tube in the flattened condition in the at-rest condition of said valve including first means in aligned contact with opposite sides of said outlet tube at a location spaced from said outlet end and for moving in the axial direction of and relative to said outlet tube from the location of the at-rest condition to the outlet end of said outlet tube with said first means remaining in opposite aligned contact with said outlet tube whereby said valve is in the dispensing condition for permitting flow out of the outlet end of said tube and for effecting a cleaning of the flattened section of said outlet tube at the termination of the dispensing operation.

4,412,633

VENTED SYNTHETIC-RESIN JUG

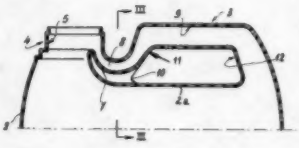
Vincent Guerrazzi, Nanterre, and Valerio Vendramini, Maubeuge, both of France, assignors to Seprosy Societe Europeenne pour la Transformation des Produits de Synthese, Paris, France

Filed Feb. 16, 1982, Ser. No. 349,172

Claims priority, application France, Feb. 17, 1981, 81 03482; May 26, 1981, 81 10835

Int. Cl.³ B65D *23/10*

U.S. Cl. 222—468 **9 Claims**



1. A jug comprising:

a hollow body shaped to contain a liquid and having a bottom, a top wall, and opposite front and rear walls extending between said bottom and top walls;

a collar formed in and projecting upward from said top wall adjacent said front wall and defining an upwardly open pour mouth, whereby a closure can be engaged sealingly with said collar;

a tubular handle having

a rear end opening into said body and connected to said top wall adjacent said rear wall and

a front end connected to said top wall spacedly adjacent said collar; and

structure unitary with said handle and top wall forming a passage extending from said front end of said handle and

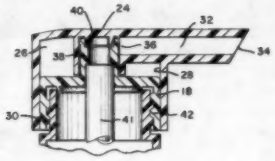
opening upward directly into said collar in said mouth, whereby when said jug is forwardly tipped to pour liquid from said mouth, air can enter said body through said passage and tubular handle.

4,412,634

CAP AND NECK UNIT FOR FLUID DISPENSER

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06425

Filed Nov. 10, 1981, Ser. No. 319,947
Int. Cl.[3] B65D *41/04, 47/20*
U.S. Cl. 222—519 3 Claims



1. A cap and neck unit for a fluid dispenser, said unit comprising:

a vertical neck adapted for use with a fluid container, said neck having interconnected upper and lower sections, the lower section defining a first hollow vertical cylinder having a first diameter, said first cylinder having a closed top end with a central circular opening having a second and smaller diameter, said upper section defining a second hollow vertical cylinder having said second diameter and open at its upper and lower ends, the lower end being coincident with said central opening, the outer surface of said first cylinder having a single continuous endless groove which has upper and lower horizontal regions interconnected by inclined regions;

a cap having a top and a vertical interior chamber extending downwardly from the top and terminating in a hollow cylindrical region open at bottom, said region having a third cylindrical diameter larger than said first diameter and disposed concentrically about said neck, said region having an inwardly extending horizontal prong engaging said groove, said cap being rotatable about said neck between a first position at which said prong engages said lower horizontal region and the vertical separation between said top and said upper end of the upper section is a minimum and a second position at which said prong engages said upper horizontal region and said separation is a maximum;

an elongated hollow discharge conduit open at both first and second ends and secured to said top, the second end of the conduit being disposed outside the chamber and constituting a discharge orifice, said first conduit end being horizontally spaced from and disposed above the upper end of the upper section; and

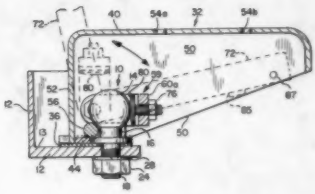
sealing means secured to said top and disposed within said chamber, said sealing means including a third vertical hollow cylinder secured at its upper end to said top and open at its lower end, said third cylinder having a fourth diameter larger than said second diameter and smaller than said first diameter, said third cylinder being disposed concentrically about said second cylinder, and further including a sealing member secured to said top and disposed within the third cylinder, said first conduit end being connected to the third cylinder and communicating with the interior thereof, said means closing the upper end of the upper section and closing said first conduit end with said member being in sealing engagement with the upper end of the upper section when said cap is in the first position, said means leaving the upper end of the upper section open with said member being spaced above the upper end of the upper section to establish communication between said first conduit end and the upper end of the upper section when said cap is in the second position.

4,412,635

TRAILER HITCH-MOUNTED UTILITY CARRIER FOR VEHICLES

Franklin B. Bateman, 3040 Table Rock Rd., Medford, Oreg. 97501

Filed Aug. 12, 1982, Ser. No. 407,575
Int. Cl.[3] B60R *9/06*
U.S. Cl. 224—42.03 R 12 Claims



1. A utility carrier for attachment to a trailer hitch of a vehicle in which the hitch includes a hitch ball and an underlying support for the carrier, said carrier comprising:

a carrier member including an upper wall for attaching and supporting a load, and a slotted lower wall for receiving a neck portion of the hitch ball; and

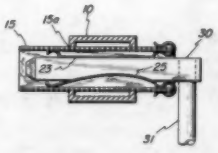
force-applying means cooperable with said carrier member for selectively applying a clamping force to clamp a portion of said carrier member between said ball and said underlying support to secure said carrier member to the vehicle.

4,412,636

GARMENT HANGING APPARATUS FOR PASSENGER AUTOMOBILES

Thomas K. Greene, 190 Weeks Rd., Glen Falls, N.Y. 12801

Filed Aug. 13, 1982, Ser. No. 407,779
Int. Cl.[3] B60R *7/00*; A47F *7/24*
U.S. Cl. 224—313 10 Claims



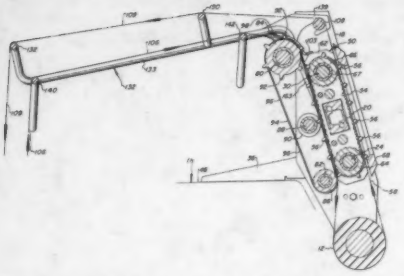
1. Garment hanging apparatus for passenger automobiles comprising an elongated hanger beam shaped and adapted for secure attachment in fixed position to an automobile roof structure and having a plurality of transverse apertures, a hollow hanger receptacle post disposed in each aperture and secured to the hanger beam, a plurality of garment hangers having terminal portions to be received in the hanger receptacle post in the hanger beam, and resilient means disposed within the hanger receptacle post for resiliently and releasably engaging garment hanger portions inserted into the said post in assembling the hanger with the hanger beam.

4,412,637

BIDIRECTIONAL DOCUMENT FEED TRACTOR UNIT

Michael A. Berger, Richardson, Tex., assignor to Datamarc, Inc., Dallas, Tex.

Filed Oct. 5, 1981, Ser. No. 309,462
Int. Cl.³ B65H *29/12, 17/38*
U.S. Cl. 226—172 **20 Claims**



1. A document feeding tractor unit adapted to be mounted on a printer having a rotatable platen, said tractor unit comprising:

a frame;

a pair of document tractor mechanisms mounted spaced apart on said frame, said tractor mechanisms each including a tractor belt supported for linear traversal along oppositely moving runs, said tractor belt including a plurality of spaced apart projections engageable with said document at spaced apart perforations formed along a longitudinal side of said document;

a support member associated with each of said tractor mechanisms;

an endless flexible support belt engaged with spaced apart rotatable members mounted on said support member, said support belt being movable along one run of said tractor belt in supportive relationship with said document for maintaining said document engaged with said tractor belt, said support belt including spaced apart apertures formed therein and engageable with respective ones of said projections on said tractor belt whereby said support belt is driven by said tractor belt; and

a sprocket rotatably mounted on said support member and in driven engagement with said support belt, said sprocket being drivably engageable with said document for positively driving said document in timed relation with said tractor belt.

4,412,638

PINCH PRESSURE-ADJUSTING DEVICE FOR A PAIR OF PINCH ROLLERS USED WITH DUAL CAPSTAN TYPE TAPE-RUNNING APPARATUS

Hideo Tomabechi, Higashiyamato, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,950
Claims priority, application Japan, Sep. 30, 1980, 55-139410[U]
Int. Cl.³ B65H *17/20*; G11B *5/54*
U.S. Cl. 226—190 **14 Claims**

1. A pinch pressure-adjusting device for a pair of pinch rollers used with a bidirectional dual capstan type tape-running apparatus which is provided with first and second capstans jointly rotated in either of two opposite directions at an equal speed, and first and second pinch rollers respectively associated with said first and second capstans for clamping a tape in cooperation with the respective corresponding first and second capstans to let said tape travel in either of said two opposite directions, said pinch rollers being mounted on respective rotary shafts, the pinch pressure-adjusting device comprising:

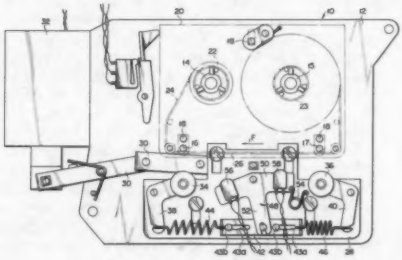
urging means mounted on said first and second pinch rollers to urge them to be pressed against their corresponding respective first and second capstans; and

urging force-adjusting means mounted on said urging means such that when the tape travels in a direction from said first pinch roller to said second pinch roller the urging means causes said second pinch roller to be urged toward its respective capstan with a greater force than said first pinch roller, whereby said second pinch roller applies greater pinch pressure to the tape than said first pinch roller, and said urging force adjusting means causing, when the tape travels in a direction from said second pinch roller to said first pinch roller, said first pinch roller to be urged toward its respective capstan with a greater force than said second pinch roller whereby said first pinch roller applies a greater pinch pressure to the tape than said second pinch roller;

said urging means comprising:

first and second pinch roller-supporting members which rotatably hold said first and second pinch rollers respectively, each pinch roller-supporting member having a pivotal shaft which is in parallel with said rotary shafts of said pinch rollers;

a first urging member having two ends, one end of which is fixed to said first pinch roller-supporting member which rotatably holds said first pinch roller; and



a second urging member having two ends, one end of which is fixed to said second pinch roller-supporting member which rotatably holds said second pinch roller; and

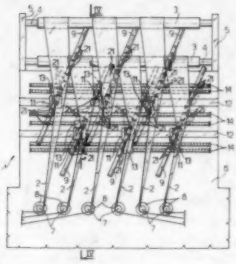
said urging force-adjusting means comprising a movable member which is connected to another end of said first urging member and to another end of said second urging member, said movable member being shiftable between a first position in which said movable member is more spaced from said first pinch roller-supporting member than from said second pinch roller-supporting member and a second position in which said movable member is more spaced from said second pinch roller-supporting member than from said first pinch roller-supporting member, and when the tape travels from said second pinch roller to said first pinch roller, said movable member takes said first position to cause said first urging member to produce a greater urging force than said second urging member, and, when the tape travels from said first pinch roller to said second pinch roller, said movable member takes said second position to cause said second urging member to produce a greater urging force than said first urging member.

4,412,639

DEFLECTOR AND INVERTER DEVICE FOR STRIPS OF WEB MATERIAL

Bruno Caletti, Casale Monferrato, Italy, assignor to Officine Maccaniche Giovanni Cerutti S.p.A., Alessandria, Italy

Filed Sep. 14, 1981, Ser. No. 301,825
Claims priority, application Italy, Nov. 4, 1980, 68685 A/80
Int. Cl.³ B65H *23/32, 19/04*
U.S. Cl. 226—197 4 Claims



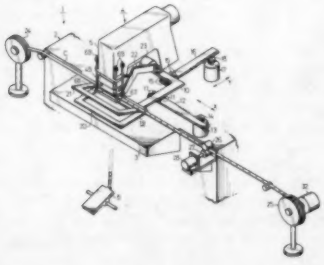
1. A deflector and inverter device for axially movable strips of flexible sheet material comprising for each of the strips: an input roller perpendicular to the direction of advance of the strip; an output roller disposed at substantially 90° relative to said input roller; and a deflector bar disposed in an intermediate position with respect to said input and output rollers and operable to support a portion of the strip extending between said rollers means for supporting said bar for rotation; about an axis parallel to said output roller to assume, selectively, two symmetrical positions with respect to said portion of the strip; in each of said positions said bar forming an angle less than 45° with said portion of the strip.

4,412,640

APPARATUS FOR ATTACHING A PLURALITY OF STUDS ON FLEXIBLE SHEET MATERIAL

Akira Sugiyama, Nagoya, and Kunio Hirota, Aichi, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 14, 1981, Ser. No. 330,084
Claims priority, application Japan, Dec. 20, 1980, 55-181076; Jan. 20, 1981, 56-7586
Int. Cl.³ B27F *7/21*
U.S. Cl. 227—85 8 Claims



1. Apparatus for attaching a plurality of studs to a flexible sheet material, each of said studs having a head portion and at least one leg portion, said apparatus comprising,

a frame having a work table,

a holder for holding said flexible sheet material on said work table,

supply means for supplying said studs one by one to said flexible sheet material,

plastic working means including a punch and die set for attaching said studs on said flexible sheet material,

said punch and die set being disposed oppositely on both sides of said flexible sheet material and relatively movable for plastic working action between a closed position and a separate position,

said punch and die set being adapted to cause said leg portion of said stud to pierce through flexible sheet material and subsequently to cause said plastic working action against said leg portion for attaching said stud to said flexible sheet material according to the movement of said set of punch and die to said closed position,

drive means for varying the relative position between said holder and said plastic working means, and

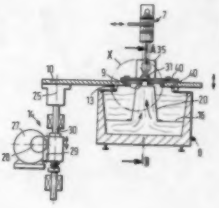
control means for controlling the operation of said supply means and said drive means during said movement of said punch and die set in said separate position.

4,412,641

DESOLDERING APPARATUS

Gottfried Fuchs, Dorfprozelten; Ewald Garrecht, Wertheim-Sachsenh.; Lothar Rieck, Wertheim; Wolfgang Rüppel, Kreuzwertheim-Röttbach; Rudolf Schwarz, Schwieberdingen, and Erich Siegle, Eberdingen-Hochdorf, all of Fed. Rep. of Germany, assignors to Ersa Ernst Sachs GmbH & Co. KG, Wertheim am Main, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 302,077
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3040274
Int. Cl.³ B23K *3/00*
U.S. Cl. 228—37 6 Claims



1. Apparatus for desoldering electronic components from conductor boards, including a solder nozzle at the lower side of the conductor board and an arrangement for the removal of residual solder from the bores of the conductor board, comprising in combination: a second means defining a sub-atmospheric pressure space at the lower side of the conductor board; means accommodated to the dimensions of the component to be desoldered and removably defining an inlet opening to the sub-atmospheric pressure space; and opening means in the second means forming a delimitation for a solder wave issuing from said solder nozzle from below the second means.

4,412,642

CAST SOLDER LEADS FOR LEADLESS SEMICONDUCTOR CIRCUITS

John R. Fisher, Jr., Plainsboro, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

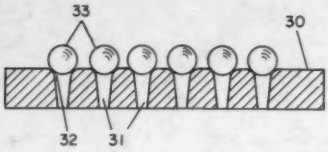
Filed Mar. 15, 1982, Ser. No. 358,412
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—173 R 11 Claims

1. A method for forming an electrically conductive lead comprising the steps of:

positioning an electrically conductive preform in alignment with a mold cavity of a molding plate;

heating the molding plate to a predetermined reflow temperature;

applying a force on the preform during the heating step



thereby forcing molten preform material into said mold cavity;

cooling the molding plate; and

removing the applied force.

4,412,643

METHOD FOR BONDING OF A POROUS BODY AND A FUSION-MADE BODY

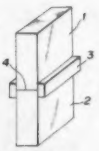
Tomio Sato; Kunio Okimoto, and Toshio Yamakawa, all of Tosu, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,214

Claims priority, application Japan, May 26, 1980, 55-69975

Int. Cl.³ B23K *1/04*

U.S. Cl. 228—221 **5 Claims**



1. A method for bonding a porous body and a fusion-made body which comprises the steps of

(a) bringing a surface of the porous body and a mating surface of the fusion-made body into contact with each other,

(b) placing an infiltrater material having a lower melting point than the porous body and the fusion-made body at a side of the contacting surfaces between the porous body and the fusion-made body, and

(c) heating the infiltrater material and the porous body and the fusion-made body in contact with each other, while maintaining a contacting pressure of at least 5 Kg/cm^2 at the contact surfaces, to a temperature exceeding the melting point of the infiltrater material but lower than the melting points of the porous body and the fusion-made body in an inert atmosphere.

4,412,644

SPILL RESISTANT DISPOSABLE PAPER DRINKING CUP

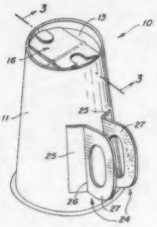
William C. La Fever, Box 2958 Star Rt. 31, Las Vegas, Nev. 89101

Filed Jul. 20, 1981, Ser. No. 284,779

Int. Cl.³ B65D *3/26*

U.S. Cl. 229—1.5 B **5 Claims**

1. A spill resistant, invertable, disposable paper drinking cup, comprising in combination, a side wall rolled around a small sized end wall at one end thereof, and a spaced apart larger sized open end at the other end thereof, an opening formed in said end wall, reusable tab means for covering said opening, sealing means for initially sealing said tab means over said opening in a leak proof manner, means for retaining said tab means in a closed condition over said opening after being unsealed, cover means for closing said open end, and additional sealing means for sealing said cover means to said open end in a leak proof manner, whereby said cup can be used with the open end upward prior to unsealing of the tab whereby said end walls forms the bottom of the cup, and said cup can also be



used in an inverted manner by sealing of said cover means to the open end and unsealing said tab means to utilize said opening for access to the cup, whereby said cup cover means forms the bottom of the cup and the cup has an outward flare in a downward direction for greater stability.

4,412,645

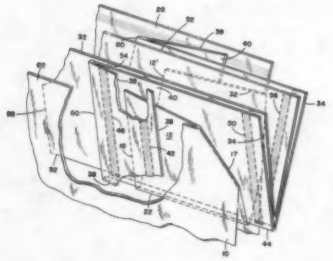
SELF-SEALING BAG SLEEVE

J. George Lepisto, Middletown, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 29, 1981, Ser. No. 316,223

Int. Cl.³ B65D *30/24*

U.S. Cl. 383—48 **6 Claims**



1. In a bag having opposed side walls for containing a flowable product therein, the bag also having first and second opposed closed ends, one of said ends having a self-sealing sleeve formed therein through which flowable product may be delivered into the bag, the improvement comprising said self-sealing sleeve including:

a. a first generally tubular sleeve formed by folding one side of said one end of said bag inwardly so that the opposed side walls of said bag extend into said bag at said one side of said one end,

b. a second generally tubular support sleeve located at least partially inside of said first sleeve, one end of said second tubular sleeve being folded back on itself to form a U-shape into which said first tubular sleeve is placed and adhesively attached in a strip along the entire width thereof, and

c. a third generally tubular sleeve of substantially reduced thickness and greater flexibility than said second sleeve adhesively attached inside of said second sleeve along two spaced parallel strips extending across the entire width of said third sleeve, the third sleeve extending in length beyond the end of said second sleeve into the interior of said bag between said opposed side walls,

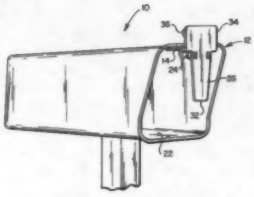
wherein said second tubular sleeve and said third tubular sleeve extending beyond said second tubular sleeve are held in place by closing and sealing said one end of said bag over said second and third sleeves.

4,412,646

TWO-PIECE MECHANICAL FLAG

David A. Hollenbach, 777 Irvin-Shoots Rd., Marion, Ohio 43302

Filed Apr. 28, 1982, Ser. No. 372,577
Int. Cl.[3] A47G *29/12*
U.S. Cl. 232—34 8 Claims



1. In the combination of a generally linearly extending tube for receiving printed matter inserted therein and a signaling device for visually indicating to an observer who is remote from the tube that something has been inserted in the tube,

the tube having an axis and being elongated with one end being open at least part of the time,

the signaling device including a mounting member which extends in the same linear direction as the tube, said mounting member having one end rigidly fixed to said tube and the other end extending beyond the open end,

a pivoting arm pivotally attached to said other end of said mounting member,

said pivoting arm having the physical property of being able to pivot through an angle of 180°, except for the angle superintended by the thickness of the mounting member, when said mounting member is not attached to said tube,

said pivoting arm being limited to pivoting through an angle not substantially greater than 90° when said mounting member is attached to said tube, said 90° angle being one where the pivoting arm extends generally parallel with the axis of the tube at one extreme and perpendicular to that axis in the other extreme,

the pivoting arm including portions extending in two directions from its pivotal attachment to said mounting member, said directions being about 180° apart, one said portion being pivotable from a location parallel with the axis of the tube to a location where it extends across the end of the tube which is open at least part of the time, the one portion of the pivoting arm extendable across the end of the tube being of such a width and length that anything being pushed into or pulled from the inside of the tube will engage said one portion to thereby pivot it about 90° to orient it generally parallel with the axis,

the other portion of the pivoting arm extending in its one extreme in a plane generally parallel with a plane defining the opening into said tube but beyond the tube surface a distance sufficient that it may easily be observed by said remote observer,

said mounting member including a flat portion coated with adhesive at the end fixed to the tube,

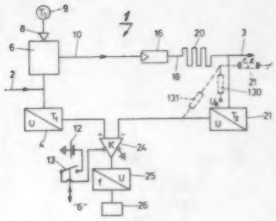
said mounting member further including an angled portion intermediate said flat portion and the pivot connection with the pivoting arm whereby the pivot is radially off-set from the point said mounting member is fixed to the tube.

4,412,647

MEASURING USE OF HEAT OR THE LIKE AT INDIVIDUAL ZONES SUPPLIED FROM ONE SOURCE

Heinz Lampert, Buchs, Switzerland, assignor to Willy Lanker, Zumikon, Switzerland, a part interest

Continuation-in-part of Ser. No. 143,265, Apr. 24, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,383
Claims priority, application Switzerland, Apr. 25, 1979, 3875/79; Apr. 10, 1980, 2754/80
Int. Cl.[3] G01K *17/00*
U.S. Cl. 236—36 7 Claims



1. In a system wherein a fluid medium is conducted from a pressurized source thereof through each of a plurality of zones of use, to satisfy demands at said zones for a characteristic of said medium that has a measurable and variable magnitude, and wherein each of said zones has an independently varying demand for said characteristic, measuring means for determining the total amount of said characteristic supplied to each said zone during a predetermined time interval, said measuring means comprising,

for each said zone:

A. control means at the zone for producing a demand output at times when flow of said medium through the zone is required;

B. an on-off valve connected between said source and the zone and operatively connected with said control means, for permitting said medium to flow through the zone only when said demand output is being produced;

C. an automatic flow control device connected in series with said on-off valve for maintaining a predetermined substantially constant rate of flow of said medium through the zone whenever such flow is permitted;

D. sensing means for producing a continuous difference output which is at every instant proportional to the existing difference in said magnitude as between said medium flowing into the zone and said medium flowing out of the zone;

E. integrating means connected with said sensing means for producing a unit output each time the integral of said difference output with respect to time attains a predetermined value;

F. recording means connected with said integrating means for recording the number of said unit outputs issued during said predetermined time interval; and

G. switch means controlled by said control means and connected between said sensing means and said recording means to prevent unit outputs from being fed to said recording means at times when no demand output is produced.

4,412,648

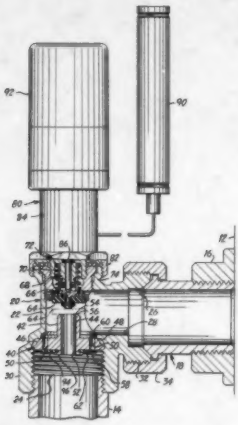
CONTROL VALVE ASSEMBLY FOR STEAM RADIATORS

Thomas H. Ford, Tarrytown, N.Y., and Arend Sasserath, Moenchen-Gladbach, Fed. Rep. of Germany, assignors to Ammark Corporation, Fair Lawn, N.J. and Hans Sasserath & Co. KG, Fed. Rep. of Germany, a part interest

Filed Apr. 1, 1982, Ser. No. 364,427

Int. Cl.³ G05D *23/12*

U.S. Cl. 236—42 **8 Claims**



1. A control valve assembly for use in a one-pipe steam heating system in which incoming steam and outgoing condensate are carried to and from a radiator by a single pipe connected to the radiator through the valve assembly for supplying heat to the ambient atmosphere at the radiator, the valve assembly comprising:

a valve body;

first and second ports in the valve body;

a conduit within the valve body, the conduit interconnecting the first and second ports;

means for enabling connection of the first port to said single pipe;

means for enabling connection of the second port to said radiator;

a valve element affixed within the conduit between the first and second ports, the valve element including an axially-extending tubular portion and a radially-extending flange portion;

a first valve passage located in the valve element and passing axially through the tubular portion thereof, the first valve passage interconnecting the first and second ports and including a first end adjacent the first port and a second end adjacent the second port;

a first valve seat located at the second end of the first valve passage;

a first valve member movable into and out of contact with the first valve seat to close and open the first valve passage;

temperature-responsive means coupled to the first valve member for moving the first valve member in response to the temperature of the ambient atmosphere at the radiator for controlling the passage of incoming steam from the single pipe to the radiator;

a second valve passage located in the valve element and passing axially through the flange portion thereof, the second valve passage interconnecting the first and second ports and including a first end adjacent the first port and a second end adjacent the second port;

the second end of the first valve passage being spaced axially from the second end of the second valve passage by the tubular portion of the valve element such that the first valve seat is spaced axially away from the second end of the second valve passage to assure access to the second valve passage by the outgoing condensate when the first valve member is in contact with the first valve seat and to separate incoming steam at the second end of the first valve passage from condensate at the second end of the second valve passage when the first valve member is out of contact with the first valve seat;

a second valve seat located at the first end of the second valve passage; and

a second valve member movable in response to pressure differences between the first and second ports into and out of contact with the second valve seat to close and open the second valve passage, the second valve member being movable into contact with the second valve seat in response to a higher pressure at the first port to preclude the passage of incoming steam through the second passage and being movable out of contact with the second valve seat in response to a higher pressure at the second end of the second valve passage to enable the passage of outgoing condensate from the radiator to the single pipe.

4,412,649

ARRANGEMENT IN CLIMATIZATION SYSTEMS

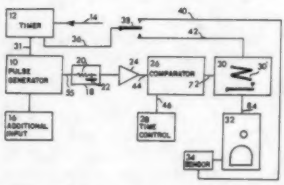
Kjell Claesson, Huddinge; Stig Rönnerholm, Handen, and Rolf Strand, Huddinge, all of Sweden, assignors to Tour & Andersson Aktiebolag, Stockholm, Sweden

Filed Apr. 5, 1982, Ser. No. 365,475

Claims priority, application Sweden, Jun. 12, 1981, 8103698

Int. Cl.³ F23N *5/20;* **H03K** *5/00*

U.S. Cl. 236—46 R **10 Claims**



1. An arrangement for starting and stopping, respectively, a climatization system, e.g. a heating system for a locality, dependent upon, at least, the interior temperature proper of the locality and the out door temperature, characterized thereby that said arrangement comprises a pulse generator for creating pulses forming a pulse train of successively changed pulse-time-relation, said train of pulses being fed to an equalization device and from this, in the form of a successively changed, preferably D.C. voltage which is at least approximately free from A.C. components, to a comparator which is also fed with a voltage from a means indicating the outdoor temperature so that when a state of balance is obtained between the two voltages, a signal is transmitted for starting the climatization system.

4,412,650

SNAP ACTING HEAT MOTOR OPERATED GAS VALVE

Kevin L. Young, Garrett, and Jesse H. Turner, Auburn, both of Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 25, 1982, Ser. No. 361,949

Int. Cl.³ G05D *23/10*

U.S. Cl. 236—48 A **5 Claims**

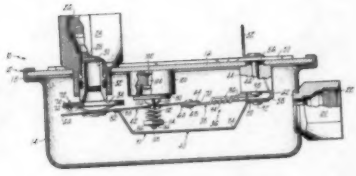
1. In a heat motor operated gas valve having a housing provided with a valve seat extending into said housing from a gas outlet in one wall of said housing, and further having a valve member normally biased to a closed position seated on said valve seat and operable by a control bimetal strip carrying an electric heater to remove said valve member from said

valve seat when said heater is energized to heat said control bimetal strip; an improved heat motor operator comprising:

means for fixedly support said control bimetal strip by one end portion within said housing, the other end portion of said control bimetal strip being free to move in response to temperature changes;

a spring blade having opposed ends, one of said ends of said spring blade being secured to said other end portion of said control bimetal strip, said valve member being carried on the other end of said spring blade;

an ambient temperature compensating bimetal member mounted in said housing at its one end and having an outer cantilever portion offset from its fixed end in generally parallel and spaced relation to said bimetal strip, said cantilever portion being arranged to flex relative to its fixed end and having a free end acting on said spring blade adjacent said other end thereof; said ambient temperature compensating bimetal member and said control bimetal strip being arranged to deflect in opposite directions upon similar changes in the temperatures thereof; said ambient temperature compensating bimetal member having a substantially greater effective length and a correspondingly substantially lower deflection constant than said control bimetal member such that respective changes in the forces due to thermal stresses exerted upon said spring blade by said control bimetal strip and said ambient temperature



compensating bimetal member upon a change in ambient temperature substantially offset each other;

magnetic means operable in conjunction with said control bimetal strip and said spring blade for effecting a snap action in movement of said valve member from and toward said valve seat, said magnetic means comprising an armature member and a permanent magnet member disposed adjacent said armature member in a position to attract said armature member, one of said magnetic means members being carried by said spring blade intermediate the ends thereof and the other of said magnetic means members being mounted in said housing in a position for urging movement of said valve member toward said valve seat;

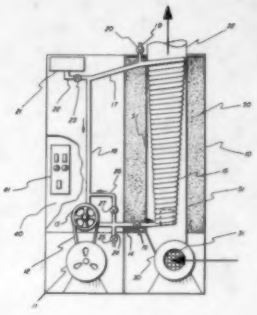
said control bimetal member being operable upon a predetermined heating thereof by said heater to apply an operating force to said spring blade of a magnitude sufficient to overcome the magnetic attractive force between said armature member and said permanent magnet member and to thereby remove said valve member from said valve seat with a snap action; said armature member and said permanent magnet member cooperating to effect a snap action closing of said valve member on said valve seat upon return movement of said spring blade after sufficient cooling of said control bimetal strip following deenergization of said heater.

4,412,651

HEATING UNIT

John E. Webster, Jr., 180 High Range Rd., Londonderry, N.H. 03053

Filed Apr. 26, 1982, Ser. No. 371,824
Int. Cl.³ F24C 9/00
U.S. Cl. 237—1 R **4 Claims**



1. A space heater comprising:

(a) a motor driven pump adapted to the forcing of a working fluid through a hydraulic circuit;

(b) a hydraulic circuit filled with said working fluid and receiving said working fluid from the outlet of said pump and returning said working fluid to the inlet thereof;

(c) flow restricting means in said hydraulic circuit effecting a substantial pressure drop in and shearing of said working fluid circulating therethrough to produce turbulent flow of said fluid;

(d) fluid circulating means for circulating fluid to be warmed by heat exchange contact with at least a portion of said hydraulic circuit; and

(e) a phase change heat store means comprising in at least one of its operable phases thereof a solid in heat exchange relationship with a portion of said hydraulic circuit and said working fluid therein, said phase change heat store means by reason of a phase change thereof removing heat energy from said hydraulic circuit when the temperature of said working fluid therein exceeds a predetermined level and returning said heat energy thereto when said temperature falls below said predetermined level;

wherein said hydraulic circuit includes an elongated coil, said circulating fluid is circulated over the surface of the coil and said solid of said phase change heat store means is disposed around the exterior thereof and there is a by-pass conduit connecting with said hydraulic circuit after the outlet of said pump and upstream of said flow restricting means and after said cylindrical coil.

4,412,652

ECONOMIZER FOR BUILDING HEATING SYSTEMS

Herman Voss, and Fern E. Voss, both of 155 Vista Ter., Wolf Lake, Muskegon, Mich. 49442

Filed Feb. 27, 1981, Ser. No. 238,814
Int. Cl.³ F24H 3/06
U.S. Cl. 237—16 **23 Claims**

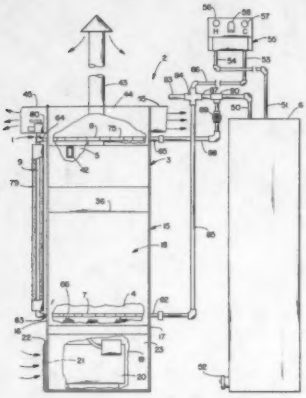
1. In a heating system for buildings having a conventional, forced-air furnace and a hot water reservoir, wherein said conventional furnace has a combustion chamber with burners mounted therein, and a heat exchange chamber through which air is flowed and heated by said burners, the improvement of an economizer, comprising:

a first heat transfer coil, having inlet and outlet sides, and being mounted in communication with the combustion chamber of said furnace;

means for communicating the inlet side of said first heat transfer coil with a source of water;

a second heat transfer coil, having inlet and outlet sides, and being mounted in communication with the heat exchange chamber of said furnace;

means for communicating the outlet side of said first heat transfer coil with the inlet side of said second heat transfer coil, and comprising an insulated standpipe extending along an exterior side of said conventional furnace;



means for communicating the outlet side of said second heat transfer coil with an inlet side of said hot water reservoir; and

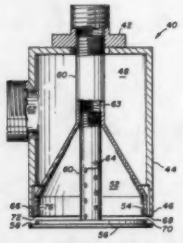
means for selectively flowing water from said source through said economizer, whereby during operation, the water is heated in said first heat transfer coil by said burners, and flowed through said second heating coil to transfer additional heat to the air flowing through said heat exchange chamber and simultaneously heat the water fed into said water reservoir.

4,412,653

SONIC ATOMIZING SPRAY NOZZLE

Gerald E. Bresowar, Homewood, and Thomas K. Benton, Birmingham, both of Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 2, 1981, Ser. No. 308,002
Int. Cl.³ B05B *3/14*
U.S. Cl. 239—102 **4 Claims**



1. A spray nozzle comprising:

a. a support body;

b. an open-ended outer cylindrical shell extending from said support body;

c. a support stem extending from said support body coaxially through said outer cylindrical shell and open end thereof;

d. an open-ended inner shell disposed coaxially within and in spaced relationship from said outer shell so as to define a first plenum chamber between said inner shell and said outer shell and a second plenum chamber within the interior of said inner shell, the open end of said inner shell extending to the open end of said outer shell in closely spaced relationship therewith thereby defining a circumferentially continuous

annular channel between the outer wall of said inner shell and the inner wall of said outer shell, said annular channel providing a gas passage for flow communication between said first plenum chamber and the open end of said outer shell, and providing an annular discharge outlet;

e. a resonator plate supported from said stem in spaced relationship from and facing the open end of said inner shell and disposed substantially coaxially therewith thereby defining a continuous circumferential slit between said resonator plate and the open end of said inner shell about the outer edge thereof, said continuous circumferential slit providing a liquid passage for flow communication between the second plenum chamber and the open end of said outer shell, said circumferential slit and said annular channel disposed at substantially right angles along the outer edge of said inner shell, said annular discharge outlet discharging on said resonator plate;

f. atomizing gas-feeding means communicating with said first plenum chamber; and

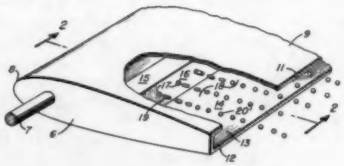
g. liquid-feeding means communicating with said second plenum chamber.

4,412,654

LAMINAR MICROJET ATOMIZER AND METHOD OF AERIAL SPRAYING OF LIQUIDS

Wesley E. Yates; Robert E. Cowden; Norman B. Akesson, all of Davis, and Paul M. Horgan, Woodland, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 11, 1981, Ser. No. 301,432
Int. Cl.³ B64D *1/18*
U.S. Cl. 239—171 **4 Claims**



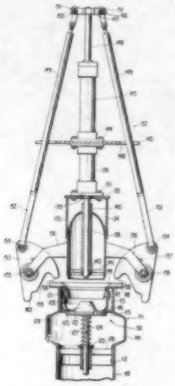
1. A laminar microjet atomizer comprising a hollow support of a streamlined configuration having an upstream portion adapted to lead in a predetermined direction of advance and having a closed leading edge and an open trailing edge, said trailing edge being bifurcated to establish a slot, a source of spray liquid within said hollow support, and means within said hollow support defining a small orifice open to said source and open opposite to said predetermined direction and disposed well upstream of said slot.

4,412,655

LAND IRRIGATION SYSTEM AND METHOD

Allen T. Noble, Boise, Id., assignor to Noble Linear Irrigation, Inc., Boise, Id.

Continuation of Ser. No. 146,122, May 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 80,060, Sep. 28, 1979, Pat. No. 4,274,584, and Ser. No. 887,792, Mar. 17, 1978, abandoned. This application Sep. 17, 1982, Ser. No. 419,321
The portion of the term of this patent subsequent to Jun. 23, 1998, has been disclaimed.
Int. Cl.[3] A01G *25/09*
U.S. Cl. 239—183 70 Claims



1. For use in connection with a land irrigation system including an elongated movable connector conduit means having a downwardly directed open end portion adapted to be connected to a water hydrant, a plurality of fixed water hydrants each having an opening in its top for receiving the open end portion of the connector conduit means, and support means operable to move the connector conduit means to position its open end portion above the opening in the top of successive hydrants and for lowering and raising the open end portion of the connector conduit means for connection with and disconnection from a hydrant positioned therebelow,

cooperating coupling means on the movable connector conduit means and on the hydrants for releasably coupling the open end portion of the connector conduit means to respective hydrants comprising,

a plurality of movable cam members mounted on the connector conduit means and projecting downwardly below and in outwardly spaced relation to the open end portion thereof, said cam members movable from a first position to a second position to releasably couple the connector conduit means to a hydrant and from the second to the first position to uncouple the connector conduit means from the hydrant,

means adjacent the top of each hydrant defining an outwardly extending ledge in position to be engaged by the movable cam members,

cam surface means on said cam members for engaging said ledge on a hydrant upon movement of said movable cam members from the first position to the second position to align the open end of the connector conduit means with the opening in the top of the hydrant and to forcibly draw the open end of the connector conduit means into the opening in the top of the hydrant and to withdraw the open end of the connector conduit means from the opening in the top of the hydrant upon movement of the cam members from the second to the first position, and

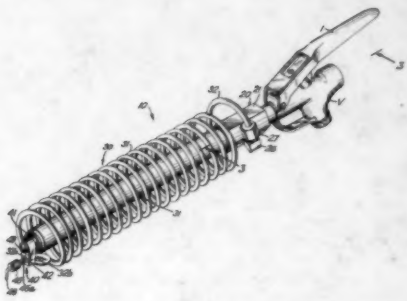
actuating means for moving the cam members between the first and second positions.

4,412,656

FLUID DELIVERY VALVE EXTENDER FOR EXTERMINATING APPARATUS AND THE LIKE

Barry Beck, 67-41 Burns St., Forest Hills, N.Y. 11375

Filed Apr. 23, 1982, Ser. No. 371,099
Int. Cl.[3] B05B *9/04*
U.S. Cl. 239—373 9 Claims



1. A fluid delivery valve extender comprising:

a. a telescopable rod comprising a plurality of telescoping tubular sections and having a first end and a relatively movable second end and means for releasably locking the sections in their fully telescoped positions;

b. adapter means connected to said rod at said first end and comprising an elongated body with one internally threaded end for connecting to said first end of the rod, means forming a fluid passage in the body having an inlet and an outlet, first means for releasably connecting the adapter means to a fluid delivery valve outlet to put the inlet of the fluid passage in fluid communication with the valve outlet comprising an internal thread at the other end of the body, wherein the means forming the fluid passage comprises a bore having one end extending into said other internally threaded end and the other end opening along the side wall of the body with an L-shaped fitting connected thereto;

c. a normally contracted, elastically deformable, coiled nylon hose disposed coaxially and loosely around the rod and having one end connected by the L-shaped fitting to the outlet of said fluid passage and in fluid communication therewith; and

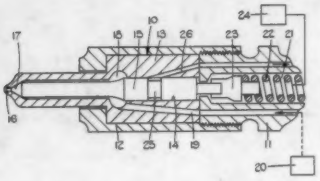
d. second means connecting the other end of the hose to said second end of the rod for movement therewith including means connected in fluid communication with said hose to effect discharge of fluid passing through the hose comprising a first member fixed to said second end of the rod and having a throughbore therein parallel to the rod and closely receiving the other end of the hose therein, an elongated discharge nozzle having a gradually tapering frusto-conical tube configured to be tightly received in the other end of the hose disposed in the throughbore with the internal passage thereof in communication with the hose and a cylindrical tip holding portion having a substantially cylindrical bore therein receptive of a nozzle tip for disposing same in fluid communication with the internal passage of the nozzle tube; whereby the fluid discharge means is disposable at desired distances from a delivery valve by the extension of the rod and the expansion of the coiled hose.

4,412,657

FUEL INJECTION NOZZLES

Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 16, 1981, Ser. No. 274,204
Claims priority, application United Kingdom, Jul. 18, 1980, 8023517
Int. Cl.[3] F02M *61/20*
U.S. Cl. 239—533.9 4 Claims



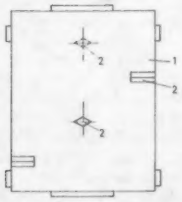
1. A fuel injection nozzle for supplying liquid fuel to an internal combustion engine and of the kind comprising a nozzle body in which is defined a blind bore, an orifice or orifices communicating with the blind end of the bore, a valve seat defined adjacent the blind end of the bore, a valve member slidable within the bore and shaped at its inner end for co-operation with said valve seat, a fuel passage leading to a space surrounding the valve member, the valve member defining a surface exposed to the fuel pressure in said space whereby when fuel under pressure is supplied through said passage, a force will act upon the valve member to lift the valve member from the valve seat to permit flow of fuel through said orifice or orifices from said space, a single groove defined between the co-operating surfaces of the valve member and the bore, and means for supplying lubricating medium to the working clearance defined between said co-operating surfaces, said means for supplying lubricating medium suppling the lubricating medium at the end of the working clearance remote from the valve seat, said groove acting to collect fuel leaking in one direction along the working clearance and lubricating medium leaking along the working clearance in the other direction.

4,412,658

METHOD AND A DEVICE FOR MANUFACTURING PARTIALLY OXIDIZED LEAD DUST

Rainer Heubach, Goslar; Reinhard Marx, Bad Harzburg, and Dieter Hauke, Vienenburg, all of Fed. Rep. of Germany, assignors to Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG, Langelsheim, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,532
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1980, 3015022
Int. Cl.[3] B02C *17/18*
U.S. Cl. 241—26 2 Claims



1. A method for manufacturing partially oxidized lead dust from lead pieces, comprising:

feeding a charge of small pieces of lead, along with air, to a rotatable drum;

rotating said drum so that said small pieces of lead are crushed to form lead dust;

mechanically disturbing the lead dust within said rotating drum in addition to dust movement caused by drum rotation alone so that the air within said rotating drum will contact substantially all of the lead dust to produce partially oxidized lead dust,

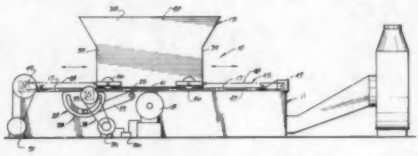
wherein mechanically disturbing the lead dust is caused by bar-like guide plates radially extending into said rotating drum and being arranged in pairs and displaced towards each other by 180° in the direction of the circumference of the drum, the guide plates of each pair of plates being axially apart.

4,412,659

SHREDDING MILL

Roger Crawford, and Duane Sanders, both of Spokane, Wash., assignors to Thermoguard Insulation Co., Spokane, Wash.

Filed Jan. 30, 1981, Ser. No. 229,661
Int. Cl.[3] B02C *13/02*
U.S. Cl. 241—35 7 Claims



1. A shredding mill for shredding material to produce particulate material of a uniform size, comprising:

a frame extending in a longitudinal direction;

a flat table top surface extending in the longitudinal direction on the frame having a shredding wheel opening formed in the surface intermediate ends of the table top surface;

said shredding wheel opening being defined by spaced end edges transverse to the longitudinal direction;

a material feed hopper reciprocally mounted on the frame for linear movement in the longitudinal direction immediately above the flat table top surface in continuous overlap of the shredding wheel opening;

said feed hopper having a top opening for receiving material to be shredded and upright end walls for directing the received material downward to a hopper bottom opening that is in open communication with the shredding wheel opening;

said hopper bottom opening having a longitudinal dimension between end edges substantially greater than the spaced distance between the transverse edges of the shredding wheel opening so that a portion of the received material is always supported on the table top surface and a portion of the material is always exposed to the shredding wheel opening;

a shredding wheel mounted on the frame in the shredding wheel opening for rotation about an axis transverse to the longitudinal dimension;

wheel drive means for rotating the shredding wheel as the feed hopper is being reciprocated to shred the material exposed to the shredding wheel opening;

hopper drive means on the frame for reciprocating the hopper in a defined stroke in which the bottom opening of the hopper is always in open communication with the shredding wheel opening and the shredding wheel is never exposed by being covered by the material;

feed grate means at the shredding wheel opening for guiding the material over the shredding wheel opening and for defining a selected cut of the material by the rotating shredding wheel;

chute means on the frame below the hopper and adjacent the shredding wheel for receiving the particulate material and

for directing the particulate material away from the shredding wheel;

wherein the chute means includes an upwardly open housing partially enclosing the shredding wheel and a discharge duct in open communication with the wheel through the housing and directed in the longitudinal direction;

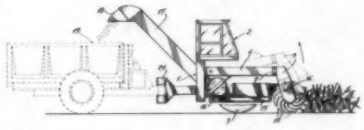
air bleed means on the housing for allowing air into the housing from an area remote from the hopper and for directing the air across the wheel below the feed grate means to receive particulate material from the shredding wheel and carry it through the discharge duct.

4,412,660

FOREST RESIDUES SWEEPER

Armand Morin, 1034 - 3rd Ave., Val d'Or, Province of Quebec, Canada (J9P 1T6)

Filed Apr. 2, 1981, Ser. No. 250,110
Claims priority, application Canada, Dec. 11, 1980, 366587
Int. Cl.³ B02C *9/04*
U.S. Cl. 241—101.7 **2 Claims**



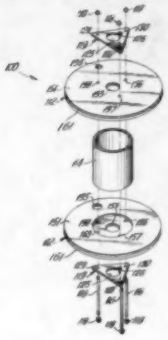
1. A forest residues sweeper for collecting, cutting and chipping tree branches, small trees and the like forest residues lying on a forest floor after removal of bigger trees, said sweeper comprising a first frame having a front portion and a rear portion, a single pair of ground-engaging and power-operated driving wheels supporting said first frame about an axis transverse to said first frame, a hitch carried by said rear portion for hitching and pulling a wheeled wagon behind said sweeper, a second frame extending over the first frame and pivoted to the the first frame about a second axis substantially parallel to said first axis and located rearwardly of and above the first frame, power means to pivot said second frame about said second axis upwardly and downwardly relative to said first frame, a third frame extending transversely of and in front of said first frame and having a central portion pivoted to the front end of said second frame about a third axis extending longitudinally of said first frame and in the plane of said second frame for tilting movement of said third frame relative to said second frame, said third frame carried by said second frame and pivotable therewith about said second axis, a pair of sweeper drums rotatably carried by said third frame in spaced end-to-end relationship for rotation about their respective drum axes, said drum axes extending transversely of said first frame and mutually inclined in a horizontal plane with the outer ends of said sweeper drums forwardly offset relative to their inner center ends, catching fingers secured to and projecting from said sweeper drums, abutment fingers secured to said third frame and interdigitated with said abutment fingers, power means for rotating said sweeper drums in a direction opposite that of said ground-engaging wheels, whereby forest residues are collected by said fingers and cut between said fingers and said abutment members, a power-operated wood chipper carried by a rear portion of said first frame, conveyor means carried by said first frame longitudinally thereof and extending between said sweeper drums and said wood chipper, and chute means carried by said first frame and in communication with an outlet of said wood chipper for discharging wood chips into said wagon.

4,412,661

SPOOL FABRICATED FROM CORRUGATED MATERIAL

Frederick M. Wise, Arvada, and Carl F. DeWitt, Westminster, both of Colo., assignors to Capitol Packaging Corporation, Denver, Colo.

Filed Oct. 20, 1981, Ser. No. 312,942
Int. Cl.³ B65H *75/28*
U.S. Cl. 242—77.4 **3 Claims**



1. A spool suitable for receiving wound pliable strands comprising:

a hollow circular cylindrical core;

two flanges, each flange being composed of at least two layers of circular corrugated material, one layer of which constitutes an innermost layer and another of which constitutes an outermost layer, the corrugations in each layer of corrugated material being arranged at an angle of about 90° with the corrugations in any adjacent layer, the innermost layer in each flange having a circular central opening in which one end of the core is received;

a plurality of reinforcing rods which pass inside the core and extend through the flanges; and

two reinforcing plates of a material more resistant to tearing than the material of the flanges, each of which is substantially smaller in area than each of the two flanges, one plate being held firmly against the outermost layer of each flange by connection to the plurality of reinforcing rods whereby a lightweight and durable spool suitable for use with conventional winding devices is formed wherein each of the reinforcing plates has a central opening therethrough and at least one of the reinforcing plates has a slot extending radially outward from its central opening, the slot being included to allow a set screw of a winding device to be screwed into the flange and to prevent excessive tearing of the flange when winding force is applied.

4,412,662

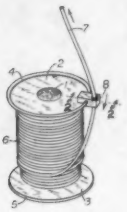
SPOOLED MATERIAL DISPENSER/HOLDER

Daniel J. Rutecki, 119 Whitley Dr., Norristown, Pa. 19403

Filed Aug. 11, 1982, Ser. No. 407,250
Int. Cl.³ B65H *75/28, 49/02*
U.S. Cl. 242—125.3 **2 Claims**

1. A spooled strand material dispenser/holder comprising a central spool core, said central spool core having integrally attached spool ends or spool end flanges, each said integrally attached spool end or spool end flange having a contoured peripheral edge, a self-lubricious movable member incorporating a congruently contoured retaining aperture or retaining profile frictionally attached and retained on a said contoured peripheral edge, said congruently contoured retaining aperture or retaining profile providing means by which the said movable member is frictionally attached to and guided by the said contoured peripheral edge of a spool end or a spool end flange,

thereby providing means by which the said movable member can move along bi-directionally and continuously along the said contoured peripheral edge of the spool end or spool end flange with a predetermined amount of frictional resistance, said movable member also incorporating a congruently contoured material dispensing aperture, said congruently contoured material dispensing aperture allowing the passage therethrough of the spooled strand material with a predetermined amount of frictional resistance when the said spooled strand material is pulled away from the plane of the spool end or spool end flange and generally parallel to the said central spool core axis causing the said movable member to move along the said contoured peripheral edge of the said spool end or spool end flange thereby dispensing the said spooled strand material from the said spool central core as required and



whereas when the pulling force on the spooled strand material is halted and the said spooled strand material is severed near the outlet of the said congruently contoured material dispensing aperture, the said spooled strand material end is held in tension by the dispensing aperture within the movable member, the said movable member being also held in position on the said contoured peripheral edge of the said spool end or spool end flange by a sufficiently intimate contact between the said contoured peripheral edge of the said spool end or spool end flange and the said congruently contoured retaining aperture or retaining profile of the said movable member thereby preventing the loosening of the remaining spooled material into a disorderly state while also holding the end of the said strand material for ready access, the said movable member also being transferrable from spool to spool.

4,412,663

MAGNETIC TAPE CASSETTE COMPRISING AN INDEXING DEVICE FOR THE UNWINDING OF THE TAPE

Dimitri M. Martinesco, Villa "Les Pins", Boulevard Maritime, 50270 Barneville Carteret, France

PCT No. PCT/FR81/00011, § 371 Date Oct. 7, 1981, § 102(e) Date Oct. 7, 1981, PCT Pub. No. WO81/02356, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 2, 1981, Ser. No. 309,891

Claims priority, application France, Feb. 8, 1980, 80 02848; May 9, 1980, 80 10506

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—200 **18 Claims**

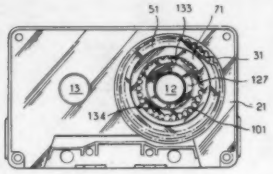
1. A standard magnetic tape cassette, comprising:

a case having a fixed index;

two reels housed in the case; and

at least one indexing device means for indexing the tape length unwound from one of said reels, said indexing device means including a two stage reduction gear assembly formed of coaxial flat rings, two of which are provided with graduations adapted to pass by said fixed index,

wherein the first reduction stage of the gear assembly includes a ring (**127**) provided with means (**133, 134**) for coupling said ring to said one of said reels so that said one of said reels rotationally drives said ring and having an eccentric circular peripheral surface (**128**), a first circular annular gear (**101**) mounted around said ring (**127**) and having external gear teeth (**105**), said first gear being mounted for oscillation with play about a fixed axis (**158**), and a second circular annular gear (**71**) rotatably mounted around said first gear and having internal gear teeth (**81, 92**) meshing with the external gear teeth of the first gear (**101**), said second gear (**71**) having an eccentric circular outer surface (**73**), and



wherein the second reduction stage of the gear assembly includes a third circular annular gear (**51**) rotatably mounted with play around said second gear (**71**) and having external gear teeth (**54**), and a fixed external annular gear (**31**) surrounding the third gear (**51**) and having internal gear teeth (**32**) meshing with external teeth (**53**) of said third gear (**51**).

4,412,664

FAMILY OF AIRFOIL SHAPES FOR ROTATING BLADES

Kevin W. Noonan, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 25, 1982, Ser. No. 392,096

Int. Cl.³ B64C *3/14*

U.S. Cl. 244—35 R **2 Claims**

1. An airfoil for a rotating blade such as a helicopter blade comprising:

airfoil means;

said airfoil means having upper surface means, lower surface means, a leading edge area, and a trailing edge;

said upper surface means having a surface slope which is positive and continuously decreasing from the position where it fairs into said upper surface leading edge area to a position at approximately 35% chord, a surface slope from approximately 35% chord to approximately 70% chord which is negative and continuously decreasing, and from approximately 70% chord to said trailing edge has a slope which is negative and continuously increasing;

said lower surface means having a slope from a position where it fairs into said lower surface leading edge to a position of approximately 44% chord which is negative and continuously increasing, a surface slope from approximately 44% chord to approximately 65% chord which is positive and continuously increasing, from approximately 65% chord to approximately 75% chord a surface slope which is positive and continuously decreasing, and a surface slope from approximately 75% chord to said trailing edge that is positive and continuously increasing;

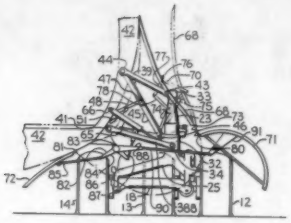
whereby the airfoil means pitching moment coefficient is minimized, a zero pitching moment coefficient at Mach numbers near 0.80 is maintained and the drag divergence Mach number is increased over a wide range of lift coefficients.

4,412,665

3-WHEELED LEVERED TRAILING BEAM LANDING GEAR

Louis T. Kramer; Franklin H. Butler, both of Long Beach, and Donald C. Callas, Fullerton, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 2, 1981, Ser. No. 317,005
Int. Cl.³ B64C 25/10
U.S. Cl. 244—102 R 13 Claims



1. An aircraft articulated landing gear of the type having a lever trailing the lever hinge axis, comprising:

a rigid axle beam, generally u-shaped with a thru axle attached at the first end and a second axle attached at the second end of said u-shaped axle beam with said axles axially parallel;

a pair of wheels attached to said thru axle on either side of said first end of said rigid axle beam and a third wheel attached to said second axle with sufficient spacing between wheels to permit removal of any wheel without first removing another wheel;

support structure pivotally attached about a pivot axis on said axle beam so that said axles rotate parallel to and about said pivot axis; and

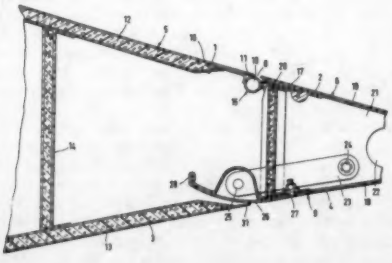
a shock strut, one end of which is attached to said axle beam near said thru axle and the other end attached to said support structure so that said axles can rotate about said pivot axis by extending and retracting said shock strut.

4,412,666

METHOD OF MANUFACTURE OF A SUPPORT WING AND FLAP

Burkhart Grob, Wendelsteinstrasse 8, 8023 Grosshesselohe, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 236,972
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010895
Int. Cl.³ B64C 3/24
U.S. Cl. 244—123 2 Claims



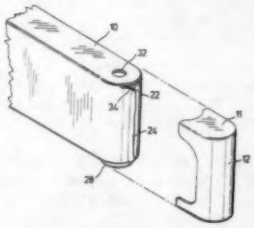
1. A method of manufacture of a wing assembly including a support wing having a flap connected thereto by a hinge means, and said support wing and flap having upper and lower outer faces comprised of a skin of synthetic material, comprising, forming the upper face skin of the support wing and flap integrally from a continuous sheet of material in a first mold, attaching the hinge means to said upper face skins on the inner sides thereof, forming the lower face skin of the support wing in a second mold, forming the lower face skin of the flap, positioning the lower face skin of the flap in the second mold adjacent said lower face skin of the support wing so that said lower face skins are unconnected, positioning said integral continuous upper face skins and said lower face skins together for joining to form the final assembly, joining said upper and lower face skins together, and cutting said integral continuous upper face skins to separate said upper face skin of said flap from said upper face skin of said support wing at said hinge means.

4,412,667

LEG FOR CHAIR BASE AND CAP THEREFORE

Frank Doerner, 138 Aberdeen Rd., Kitchener, Ontario, Canada N2M 2Y7

Filed Jul. 27, 1981, Ser. No. 286,890
Claims priority, application Canada, Feb. 12, 1981, 370735
Int. Cl.³ A47B 91/00
U.S. Cl. 248—188.7 6 Claims



1. A chair leg and a protective cap therefore, said chair leg consisting of a leg portion and an end portion, said chair leg being rectangular in cross-section with a rounded end portion, with a first aperture in the top surface thereof, and a second aperture in the bottom surface thereof, a caster socket being inserted through said second aperture, the length of said caster socket being greater than the length of said end portion, said socket being welded inside of said end portion of said chair leg, said cap being adapted to fit over and be secured to said end portion of said leg and having a small protrusion on the inside top surface which is adapted to fit into and be secured by said first aperture.

4,412,668

APPARATUS FOR ORIENTING HEAVY MOLD BASES

D. James Musiel, Racine, and James E. Buhler, Waterford, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 6, 1980, Ser. No. 204,445
Int. Cl.³ A47B 91/00
U.S. Cl. 248—346 11 Claims

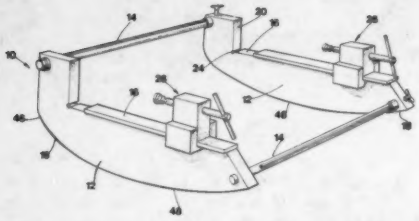
1. Apparatus for orienting heavy mold bases of varying sizes comprising:

a pair of similar rockers, each having a lower curved surface, an upper substantially planar support surface, and an abutment defining a fixed end point at one end of the support surface, the curve surface having a shorter radius at points near the abutment than at points remote therefrom;

means interconnecting the rockers in spaced, aligned relation;

means on each rocker at the opposite end of the support surface for clamping a mold base against the abutment, the clamping means defining an adjustable end point on the support surface; and

the curved surface, abutment, and clamping means of each rocker being arranged such that the tangent point of the line which is parallel to the support surface and tangent to the curved surface is closer to the adjustable end point than to the fixed end point for any adjustment of the clamping means, said support surface extending between



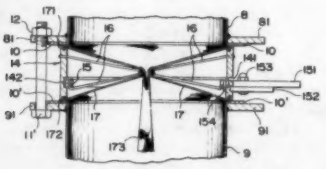
said abutment and said clamping means, said clamping means movable along said support surface to vary the effective length of said support surface whereby the said apparatus when carrying a mold base will in the absence of restraining means tip said mold base contained on said planar support surface in the direction of said abutment to lay said mold in a position for storage or maintenance.

4,412,669

FEED-CONTROL VALVE WITH CONTRACTABLE TUBE

Yoshiyuki Hanyu, 71-23 Toyoni, Kashiwa-shi, Chiba-ken, and Yasuaki Takekoshi, 1-25-8 Midori, Sumida-ku, Tokyo, both of Japan

Filed Dec. 10, 1981, Ser. No. 329,525
Claims priority, application Japan, Dec. 11, 1980, 55-175169
Int. Cl.³ F16L *55/14*
U.S. Cl. 251—4 **10 Claims**



1. A feed control valve comprising:

a tubular valve housing comprises a tubular wall having an annular guide recess, an inner surface, and an outer surface;

a valve ring angularly movably fitted in said annular guide recess and having an inner surface corresponding to the inner surface of said valve housing;

a plurality of flexible, strong and highly stretch-resistant cord spans connected between said tubular valve housing and said valve ring at substantially equally spaced angular positions along the inner surfaces of said valve housing and said valve ring,

a flexible and strong inner tube having axial ends and mounted in said valve housing and said valve ring and disposed radially inwardly of said plurality of cord spans, said inner tube having annular retainer ribs on said axial ends thereof;

said valve housing having annular grooves in which said annular retainer ribs are fitted;

said valve ring having a handle projecting radially outwardly therefrom for angularly moving said valve ring with respect to said valve housing to enable said cord spans to contract said inner tube radially inwardly from a fully-open position to a fully-closed position;

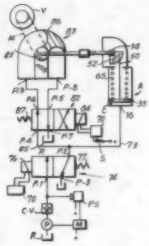
said valve housing having an arcuate slot through which said handle extends out of said valve housing, whereby said valve ring is angularly movable through an angle defined by said arcuate slot.

4,412,670

FAIL-SAFE ACTUATOR AND HYDRAULIC SYSTEM INCORPORATING THE SAME

Lorin P. Card, 16944 Plummer St., Sepulveda, Calif. 91343, and Otto W. Borsting, 2204 Stanbridge Ave., Long Beach, Calif. 91342

Division of Ser. No. 65,368, Aug. 9, 1979, Pat. No. 4,295,630.
This application Jul. 7, 1981, Ser. No. 281,087
Int. Cl.³ F16K *31/00*
U.S. Cl. 251—14 **2 Claims**



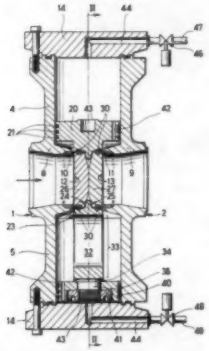
1. A fail-safe valve operating assembly including a valve member having a shaft, a hydraulic rotary vane actuator member having drive shaft means operatively connected to said shaft of said valve member for shifting the position of said shaft of said valve member and hence said valve responsive to the rotated position of said actuator member, a fail-safe actuator member operatively connected to said drive shaft means and said shaft of said valve member for shifting the positions of said shaft means and shaft, said actuator member including a casing having a cylindrical bore formed therein and having a port at one end thereof, a piston mounted for reciprocal movement within said bore between extended and retracted positions and defining with said bore a variable volume pressure chamber, spring means in said casing biased between said piston and the other end of said casing for urging said piston to said extended position whereat said piston lies adjacent said port end of said chamber, a housing on said casing, a drive shaft journaled in said housing for rotation about an axis normal the axis of said bore, a quadrant shaped yoke member mounted on said drive shaft, and including an outwardly open peripherial guide track coaxially arranged with respect to said drive shaft, a flexible cable having one end operatively connected to said piston, said cable being disposed in said guide track of said yoke member, the other end of said cable being operatively connected to said yoke member at a position to induce rotation of said drive shaft responsive to movement of said piston from said retracted to said extended condition, said cable, in said retracted condition of said piston being in slack condition whereby said drive shaft means and said shaft of said valve may be freely rotated without interference from said cable, movement of said piston from said retracted to said extended condition being effective to rotate said drive shaft and hence shift the position of said drive shaft means and said shaft of said valve member, means for introducing fluid under pressure of said port of said fail-safe actuator to shift said piston from said extended to said retracted position against the force of said spring means, and pilot valve means operatively connected to said port for venting said port responsive to a sensed failure condition to thus cause said piston to shift from said retracted to said extended condition under the force of said spring means, said rotary actuator further including a movable vane connected to the shaft thereof, said actuator having two control ports, a control

valve having two operating positions and having a pressure inlet port and a discharge port as well as two operating ports connected to the control ports of said rotary actuatory, means connecting the outlet port of said pilot valve to the pressure inlet port of said control valve, and means in one operating position of said control valve to connect one of said operating port to the discharge port and, in a second operating position, to connect said first operating port to said discharge port and the other operating port to the pressure inlet port.

4,412,671
PLATE VALVE

Edelbert Tiefenthaler, Elgg, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 10, 1981, Ser. No. 320,101
Claims priority, application Switzerland, Nov. 26, 1980, 8745/80
Int. Cl.³ F16K *25/00, 31/122*
U.S. Cl. 251—31 **7 Claims**



1. A plate valve comprising

a housing having an inlet spigot with a sealing surface and an outlet spigot with a sealing surface;

a valve member movably mounted between a closed position and an open position in said housing between and radially of said spigots, said valve member including at least one closure plate for selectively seating against one of said sealing surfaces to close said spigots from each other in said closed position and an orifice plate for selectively communicating said spigots with each other in said open position; and

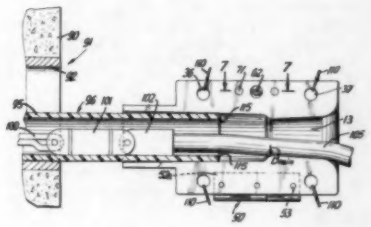
a servo-piston system for moving said valve member in said housing, said system including a pair of cylinders disposed in diametrically opposed relation about said spigots, a first piston disposed in one cylinder to define a first chamber and a second chamber therein, a second piston disposed in the second cylinder to define a third chamber and a fourth chamber therein, said second chamber and said third chamber communicating with said inlet spigot to receive a flowable medium therefrom, each said piston being fixed to said valve member and having a throttle bore extending therethrough to communicate said chambers in a respective cylinder with each other to conduct a throttled flow of medium therebetween, and a pair of valves, each valve selectively connecting an outlet chamber of said chambers in a respective cylinder with a pressure medium at a pressure different from the pressure of the medium in said inlet spigot whereby during movement of said valve member to said open position, one of said valves is opened to permit pressure medium to flow from said first chamber through said one valve while pressure medium flows from said second chamber into said first chamber through said throttle bore in said one piston to create a differential pressure on said one piston sufficient to move said valve member to said open position while pressure medium flows from said third chamber into said fourth chamber through said throttle bore in said second piston; and

during movement of said valve member to said closed position, the other of said valves is opened to permit pressure medium to flow from said fourth chamber through said other valve while pressure medium flows from said third chamber into said fourth chamber through said throttle bore in said second piston to create a differential pressure on said second piston sufficient to move said valve member to said closed position while pressure medium flows from said second chamber into said first chamber through said throttle bore in said first piston.

4,412,672
FEEDER GUIDE

Ronald P. Zelins, Rockaway, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 19, 1981, Ser. No. 313,053
Int. Cl.³ B65M *59/00*
U.S. Cl. 254—134.3 R **3 Claims**



1. A feeder guide adapted for use with products being introduced into the opening of an end length of synthetic resinous pipe, said guide comprising:

(a) a pair of tube segments corresponding to the halves of a tube produced by its vertical bisection along its longitudinal axis;

(b) said segments having similar interior channels each flaring outwardly to a front opening thereof, and each extending longitudinally through its segment from such front opening of such channel to a rear opening thereof;

(i) each such channel comprising front and rear sections extending from respectively, said front and rear openings of such channel towards each other to respective inward-section ends;

(ii) each such channel having a minimum transverse dimension at the inward end of its front channel section;

(iii) each such rear channel section having formed between its inward end and its rear opening a taper divergent towards such opening, the transverse dimension of such section being greater than said minimum dimension over the length of such section;

(iv) each such channel having formed at the inward end of the rear section thereof an internal shoulder extending transversely in such channel to provide a transition between said minimum transverse dimension thereof and said taper, said shoulder having a greater inclination to the axis of said channel than does said taper;

(v) said shoulder in each such channel and said divergent taper thereof being relatively proportioned such that the transverse dimension of such shoulder between that shoulder's transversely inner and outer extremities is greater than the difference between the transverse dimensions of such taper at, respectively, that taper's longitudinally inner and outer extremities;

(vi) the longitudinal extent in each such channel of the divergent taper thereof being several times greater than said minimum transverse dimension of such channel;

(c) coupling means pivotally connecting said segments so as to render said segments relatively movable between an open position at which they are spread apart and a closed position at which they register to jointly form an assemblage having the configuration of said tube and having formed therein a central bore with an internal annular shoulder and a rearward taper provided by, respectively, the shoulders and the said tapers of said channels; and

(d) fastening means for releasably holding said segments in said closed position;

said guide when in the form of said assemblage being adapted to have said end length of said pipe inserted into the rear opening of said bore and forcibly driven into said bore taper so as to make with the wall of said bore a wedging engagement by which such guide is frictionally held on such end length of such pipe.

4,412,673

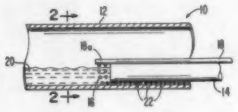
BEADED LIQUID APPARATUS AND METHOD

Scott C. Ramsden, Houston, Tex., and John C. Braman, San Rafael, Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Continuation of Ser. No. 26,617, Apr. 2, 1979, abandoned. This application Apr. 20, 1982, Ser. No. 370,029

Int. Cl.³ B65H *59/00*

U.S. Cl. 254—134.3 FT **4 Claims**



1. In combination: an outer conduit having an entrance end and containing a liquid therein; an inner member having a front end and movable through the liquid in the outer conduit; and a tube carried by said inner member and extending along the inner member, the tube having a forward portion near the front end of the inner member, said tube adapted to be coupled with a source of beads near the entrance end of the outer conduit, the tube having an opening near the front end of the inner member to permit the beads to be dispensed from the tube and into the liquid.

4,412,674

HIGH-TEMPERATURE REDUCED IRON PRODUCTION

Kimiaki Ohtawa; Hiroyoshi Takahashi, and Yasuo Fukada, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,603

Claims priority, application Japan, May 9, 1980, 55-60739; May 14, 1980, 55-62782

Int. Cl.³ C21D *11/00*

U.S. Cl. 266—91 **7 Claims**

6. An installation for transferring high temperature granular reduced iron from a furnace to a storage tank located at a position remote from said furnace, said installation comprising:

a transportable container having an inner chamber and a charge/discharge section defining an opening extending into said inner chamber, said container being arranged for rotation through 180° between a charge position, whereas said charge/discharge section and said opening are directed upwardly to receive reduced iron from the furnace, and a discharge position, whereas said charge/discharge section and said opening are directed downwardly to discharge reduced iron from said container into the storage tank;

said container including leg means for supporting said container in said discharge position thereof;

valve means for selectively unblocking said opening during charging and discharging there through and sealingly closing said opening during movement of said container between said charge and discharge positions thereof;

a cluster remover adapted to be positioned within a mouth of the storage tank, said cluster remover having means for forming a fluid-tight seal with said charge/discharge section of said container when said container is in said discharge position, and said cluster remover having a passage through which passes the reduced iron during discharge thereof from said container into the storage tank;

weighing means, adapted to be interposed between said container and the storage tank when said container is in said discharge position, for determining whether or not the reduced iron in said container has been discharged into the storage tank and for generating detection signals representative thereof; and

sealing valve means, provided on said cluster remover and operable in response to said detection signals from said weighing means, for unblocking said passage of said cluster remover when said container is charged with reduced iron and for sealingly closing said passage of said cluster remover when the reduced iron has been discharged from said container.

4,412,675

CARBON SPRING AND PROCESS FOR PREPARING THE SAME

Takamasa Kawakubo, Shinmachi, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 286,772

Claims priority, application Japan, May 11, 1981, 56-069293

Int. Cl.³ C01B *31/02*

U.S. Cl. 267—167 **13 Claims**

1. A carbon spring prepared by a process, comprising:

shaping an organic linear material, the organic constituent of which is selected from the group consisting of a thermoplastic resin, a thermosetting resin, a pitch, a natural high molecular weight substance, a synthetic high molecular weight substance containing a condensed polycyclic aromatic base structure which is high in carbon yield and mixtures thereof, into the form of a coiled spring; and then carbonizing the spring shaped organic linear material.

4,412,676

VISE FOR WORKBENCH

Ronald A. Jackson, Brockville, Canada, assignor to Black & Decker Inc., Newark, Del.

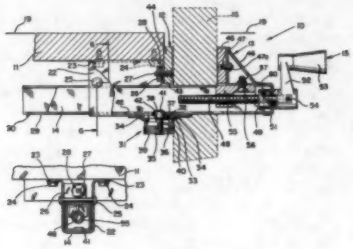
Filed Dec. 24, 1981, Ser. No. 334,453

Int. Cl.³ B25B *1/22*

U.S. Cl. 269—101 **2 Claims**

1. For use with a workbench having a table top provided with a longitudinal front edge, a vise comprising a pair of spaced brackets secured to the underside of the table top, a pair of substantially-parallel tubular beams slidably received telescopically within the brackets, respectively, manually-manipulatable independently-operable indexing means be-

tween the beams and brackets, respectively, the indexing means including a spring-loaded pin carried by the bracket, a knob carried by the pin and projecting below the bracket, and the beam having a lower longitudinal side provided with a plurality of spaced apertures for receiving the pin, selectively, whereby a plurality of coarse adjustments is provided between the beams and brackets, respectively, a longitudinally-extending rear vise jaw disposed above the beams transversely thereof and abutting the lower portion of the longitudinal front edge of the table top, means fixing the rear vise jaw to the brackets, whereby the vise is cantilever mounted to the under-



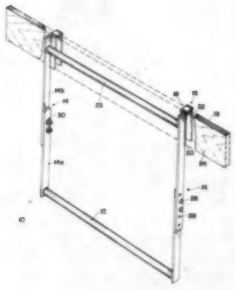
side of the table top and projects forwardly thereof beneath the extended plane of the table top, a longitudinally-extending movable front jaw slidably disposed on top of the beams transversely thereof, and means mounting the movable front vise jaw on the respective beams for movement towards and away from the fixed rear vise jaw, thereby providing for a fine adjustment in the clamping pressure exerted on a workpiece positioned between the jaws.

4,412,677

PORTABLE EXERCISE APPARATUS

Michael B. Viramontes, 142 Princeton, Vallejo, Calif. 94590

Filed Feb. 25, 1982, Ser. No. 352,253
Int. Cl.³ A63B 1/00
U.S. Cl. 272—62 **3 Claims**



1. A portable chinning apparatus comprising:

a pair of vertical posts;

a bar interconnecting said posts near the lower ends thereof;

a pair of mounting brackets, of flat steel bar stock, each of inverted U-shaped configuration including a flat horizontal top bar and parallel vertical bars at least three inches long depending therefrom and spaced to slide snugly down over a wooden rafter of nominal two inch thickness; and

means securing said posts to said brackets to be suspended therefrom;

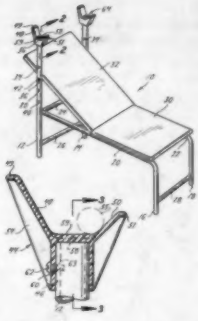
said posts being free of lateral extensions for engagement with a vertical wall.

4,412,678

SADDLE FOR BAR AND BAR-TYPE WEIGHT

William R. Baynes, DuQuoin, Ill., assignor to Turco Manufacturing Co., DuQuoin, Ill.

Continuation of Ser. No. 49,234, Jun. 18, 1979, abandoned. This application Jan. 22, 1982, Ser. No. 341,323
Int. Cl.³ A63B 21/00
U.S. Cl. 272—123 **4 Claims**



1. A saddle, which is mountable on the upper end of an upwardly-directed part of a support for a bar of a bar-type weight used by a weight lifter and which can selectively receive and support part of a bar of a bar-type weight, and which has a bar-receiving portion, a first arm which inclines upwardly and forwardly from said bar-receiving portion, a second arm which inclines upwardly and rearwardly from said bar-receiving portion, said bar-receiving portion and said arms coacting to define a saddle-like space which can selectively receive and confine said part of said bar of said bar-type weight, a socket-forming portion which extends downwardly from said bar-receiving portion and which defines a socket with an upper end that underlies at least a part of said bar-receiving portion and with a sidewall that extends downwardly from said upper end and downwardly relative to said arms and that is dimensioned to telescope down over, and to closely engage, said upper end of said upwardly-directed part of said support for a bar of a bar-type weight, said socket having an open lower end that is dimensioned to telescope down over said upper end of said upwardly-directed part of said support for a bar of a bar-type weight, said saddle being molded or cast from a readily-molded or readily-cast plastic material so it is unitary in nature and so it is wholly devoid of joints between any of said bar-receiving portion, said arms and said socket-forming portion, said socket-forming portion having the walls of said socket tapered upwardly and inwardly to provide intimate engagement between the upper, inner end of said recess and said upper end of said upwardly-directed part of said support for a bar of a bar-type weight, a reinforcing portion that is part of, and that extends between, said socket-forming portion and said first arm, said reinforcing portion extending forwardly and upwardly from said socket-forming portion to merge into said first arm, said reinforcing portion being generally tangential relative to one side of said socket-forming portion and thereby defining one side of said first arm, a second reinforcing portion that is part of, and that extends between, said socket-forming portion and said first arm, said second reinforcing portion extending forwardly and upwardly from said socket-forming portion to merge into said first arm, said second reinforcing portion being generally tangential relative to the opposite side of said socket-forming portion and thereby defining the opposite side of said first arm, second reinforcing portion being spaced from the first said reinforcing portion and coacting with said first said reinforcing portion and with said first arm to define a supporting arm which is an inverted U in end view and which is sturdy and rugged but light in weight, and said first arm and said bar-receiving por-

tion merging at a point which is immediately adjacent the upper end of said socket and said second arm and said bar-receiving portion merging at a further point which is immediately adjacent the upper end of said socket to thereby limit the moment arm of any force which a bar-type weight can apply to said bar-supporting portion.

4,412,679

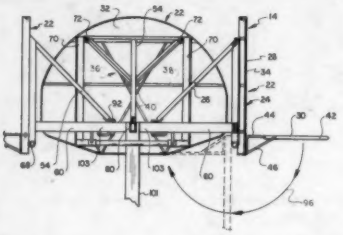
FOLDABLE BASKETBALL GOAL MEANS

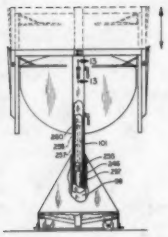
Elmo J. Mahoney, deceased, late of Dorrance, Kans. (by Regina B. Mahoney, executrix), and Kenneth J. Mahoney, Dorrance, Kans. 67634

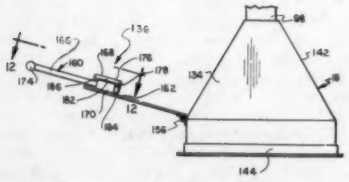
Continuation of Ser. No. 946,386, Sep. 27, 1978, abandoned. This application May 15, 1981, Ser. No. 264,127

Int. Cl.³ A63B *63/08*

U.S. Cl. 273—1.5 R **12 Claims**







8. A foldable basketball goal means used to practice exercises therewith, comprising:

(a) a basketball goal means having an individual basketball goal assembly;

(b) a goal support means having one end connected to said basketball goal assembly;

(c) a main base support means connected to a lower end of said goal support means;

(d) said main based support means includes an actuator wheel assembly mounted within a base support assembly;

(e) said base support assembly includes a main support housing having a door and handle assembly connected thereto;

(f) said door and handle assembly having a handle assembly connected to a door member;

(g) said door member is pivotally connected to said main support housing and movable to an inclined, open position and said handle assembly having a handle member slidably mounted in a connector tube secured to said door member, said handle member grasped to move the entire said foldable basketball goal means to a desired position; and

(h) said handle member movable within said connector tube to an extended position to move said foldable basketball goal means.

10. A foldable basketball goal means used to practice basketball exercises therewith, comprising:

(a) a basketball goal means having an individual basketball goal assembly;

(b) a goal support means having one end connected to said basketball goal assembly;

(c) a main base support means connected to a lower end of said goal support means;

(d) an actuator control means mounted on said main base support means and operably connected to said goal support means;

(e) said goal support means having a main support tube member and an upper telescoping tube member mounted in said main support tube member for axial movement relative thereto;

(f) said actuator control means operable to selectively move said upper telescoping tube member axially to raise and lower said basketball goal assembly as desired for the proper playing height or at a lower transport and storage height;

(g) said basketball goal assembly includes a goal and rim assembly connected to said goal support means through a foldable support assembly;

(h) said goal and rim assembly having a basketball ring mounted on a conventional type basketball goal member;

(i) said foldable support assembly includes a horizontal support assembly having said basketball goal member pivotally connected to an outer end thereof for movement of at least 180 degrees, a goal support assembly connected to an outer end thereof; a goal support assembly connected to a back side of said basketball goal member, and an inclined connector assembly mounted between said horizontal support assembly and said goal support assembly; and

(j) said inclined connector assembly may be selectively released from said horizontal support assembly to pivot a major portion of said goal and rim assembly about 180 degrees forward and downwardly to an inverted transport position.

4,412,680

FLOATING ARCADE

Thomas E. Zorn, 3302 Burt St., No. 20, Omaha, Nebr. 68131

Filed Mar. 26, 1979, Ser. No. 23,648

Int. Cl.³ A63F *7/06, 7/38, 9/02*

U.S. Cl. 273—85 H **10 Claims**

1. A floatable toy apparatus comprising

an elongated housing having opposite ends,

means for floatably supporting said housing on a body of water,

water gun means operatively connected to said housing adjacent one end thereof, and

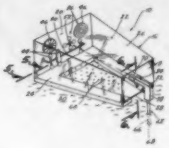
target means supported on said housing in spaced relation from said water gun means,

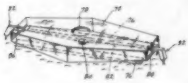
said water gun means being operative to direct a jet of water toward said target means for striking the same,

said water gun means including a siphon tube having one end operatively connected to said water gun means for supplying water thereto and an opposite end adapted for immersion in the body of water on which said housing is floatably supported to draw water therefrom in response to operation of said water gun means, and

said housing comprising a substantially transparent enclo-

sure around said target means whereby the jet of water directed at the target means by said water gun means is substantially confined within said housing,





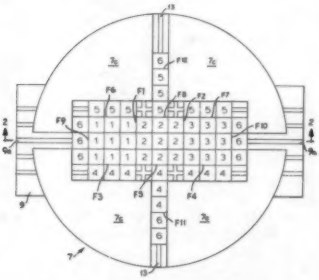
said housing including means for draining water therein back to said body of water.

4,412,681

TWO DIMENSIONAL LOGICAL TOY

Thomas J. Irwin, 1678 Nottingham Way, N.E., Atlanta, Ga. 30309

Filed Feb. 22, 1982, Ser. No. 350,725
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S **12 Claims**



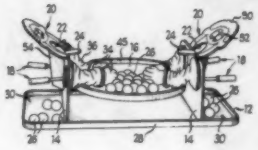
1. A two dimensional logical toy comprising a frame structure having a slide passage formed therein, a slide plate slidably mounted in said slide passage and having a plurality of parallel grooves formed in a surface thereof and an aperture extending therethrough, a lift having a platform normally disposed in said aperture and having a first group of parallel grooves formed in a surface thereof and normally in alignment with the grooves formed in said guide plate respectively, said lift being movable so as to cause said platform to move out of said aperture and being rotatable and having a second group of parallel grooves formed in said surface of said platform which are disposed in normal relation to said first group of grooves, so that predetermined rotation of said lift and movement of said platform back into said aperture causes said second group of grooves to become aligned with the grooves formed in said slide plate, and a plurality of unitary elements slidably mounted in said grooves formed in said guide plate and in said platform.

4,412,682

ACTION GAME DEVICE

Steven F. Rehkemper, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1982, Ser. No. 347,534
Int. Cl.³ A63F 7/00
U.S. Cl. 273—1 GG **12 Claims**



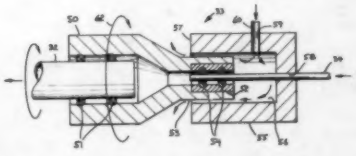
1. A game apparatus comprising:
a plurality of objects;
an object receptacle for said objects;
a manually manipulatable elongate member, including one end capable of engaging one of said objects and another end capable of being manipulated by the user;
means for limiting the range of movement of said member including an upstanding barrier adjacent said receptacle, said barrier including a port for permitting said member to extend through said barrier into communication with said receptacle and a flexible sleeve connected on one end to the member adjacent the end of the member capable of engaging one of said objects and connected on the other end to the barrier around said port; and
a receiver for said objects spaced from said object receptacle and arranged to allow said objects to be transferred to said receiver from said receptacle with said member.

4,412,683

APPARATUS FOR SUPPLYING FLUID TO A ROTATING TUBE COMPRISING END CAP WITH PURGING FLUID

Eugene A. Haney, Lawrenceville, and Fred P. Partus, Marietta, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 242,775, Mar. 11, 1981, Pat. No. 4,347,069. This application Jun. 17, 1982, Ser. No. 389,329
Int. Cl.³ F16J 15/40, 15/44
U.S. Cl. 277—3 **6 Claims**



1. A protective end member for a rotatable tubular member comprising a housing having a bore therein of greater inside dimensions than the outside dimensions of the tubular member for receiving an end of said tubular member without making contact therewith, means within said housing for permitting the introduction of fluid into the interior of said tubular member, and means within said housing for permitting the introduction of a purging fluid into said housing bore at a pressure in excess of ambient pressure to prevent contaminating materials from being introduced into the interior of said tubular member from ambient atmosphere.

4,412,684

LIQUID SEAL FOR CLOSING AN OPENING OF A REACTION VESSEL

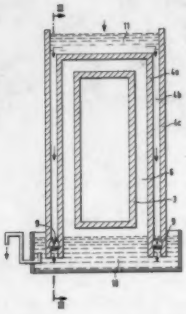
Hans-Josef Giertz, Ratingen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,131

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013650

Int. Cl.³ F16J *15/40*; C10B *25/16*

U.S. Cl. 277—135 13 Claims



1. An arrangement for sealingly closing an opening, particularly of a vessel having an internal chamber for performing chemical reactions therein, comprising, in combination, a frame member surrounding said opening; a closing member movable between a closing position in which it bounds a gap with said frame member and an opening position in which it exposes said opening; means for sealing said gap, including at least one sealing blade mounted on one of said members and extending across said gap into contact with the other member in said closing position, and a liquid seal confined in said gap adjacent to said sealing blade around the entire perimeter of said opening in said closing position; said closing member overlapping said frame member in said closing position so that said gap extends outwardly from said opening between said frame member and said closing member; said sealing blade being outwardly spaced from said opening; said liquid seal being confined in said gap at the outside of said sealing blade; said sealing means further including at least one additional sealing blade mounted on a first of said members and extending across said gap into contact with the second of said members in said closing position, and said additional sealing blade being situated inwardly of said sealing blade and defining with the latter an enclosed sealing space in said gap all around said opening.

4,412,685

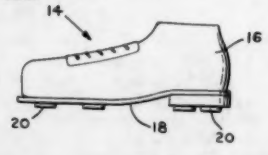
RECREATIONAL SKATE

Pierre E. Szamek, 30 Van Velsor Pl., Newark, N.J. 07112

Filed Dec. 26, 1979, Ser. No. 106,652

Int. Cl.³ A63C *17/00*

U.S. Cl. 280—11.19 1 Claim



1. Skate structure including:

a support platform;

roller means for providing a rolling contact between said skate structure and a support surface; and

first and second ring bearings for pivotally mounting said roller means to said support platform, each of said ring bearings having an outer race and an inner race, said outer race of said first ring bearing being rigidly secured to said support platform, said outer race of said second ring bearing being rigidly secured to said inner race of said first ring bearing and said roller means being secured to said inner race of said second ring bearing.

4,412,686

FOLDING STEP FOR VEHICLES

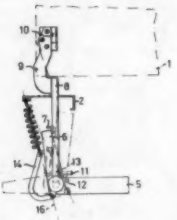
Erik T. Fagrell, Västra Frölunda, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Jun. 23, 1981, Ser. No. 277,202

Claims priority, application Sweden, Jun. 23, 1980, 8004619

Int. Cl.³ B60R *3/02*

U.S. Cl. 280—166 5 Claims



1. In combination with a vehicle having a door, a plate mounted on the vehicle for vertical swinging movement about a horizontal axis between a position in which said plate extends from said axis essentially vertically upwardly and a position in which the plate extends from said axis horizontally outwardly, and means acting between the door and the plate upon opening and closing of the door, to swing the plate between said positions, said means including a shaft secured to the door and extending downwardly from the door in extension of the door hinge line, means on the plate interacting with the shaft such that upon rotation of the shaft, the plate is caused to swing vertically, and over-center spring means acting to bias the plate toward each of said two positions as the plate moves in opposite directions between said two positions.

4,412,687

SKI

Wieme Andre, Zwevegem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Continuation of Ser. No. 80,050, Sep. 28, 1979, abandoned. This application Feb. 11, 1982, Ser. No. 347,788

Claims priority, application Netherlands, Sep. 28, 1978, 7809832; Luxembourg, Jan. 31, 1979, 80858

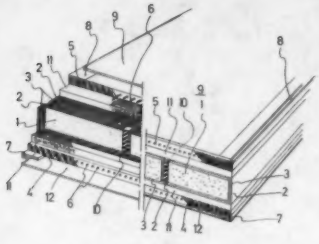
The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.³ A63C *5/00*

U.S. Cl. 280—610 10 Claims

1. A longitudinally extending ski of the laminated type comprising an elongated core of rigid material, a top external surface, a bottom skiing surface, and a layer of rubberlike material disposed in interbonding relationship between said core and at least one of said surfaces, said rubberlike material

having a loss tangent of about 0.1 and having longitudinally extending twisted filament bundles embedded therein, the



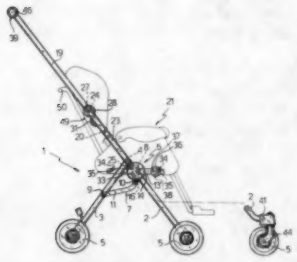
filaments having a tensile strength of at least 2000 N/mm^2 and a modulus of elasticity of at least 7×10^4 N/mm^2.

4,412,688

WHEELED SUPPORT STRUCTURE FOR A SEAT OR A CARRY-OUT OF A BABY'S PUSH CHAIR OR PERAMBULATOR

Pietro Giordani, Via Cavallina, 4, 40100 Bologna, Italy

Filed Jul. 17, 1981, Ser. No. 284,496
Claims priority, application Italy, Aug. 1, 1980, 68245 A/80
Int. Cl.^{3} B62B *7/08*
U.S. Cl. 280—642 **9 Claims**



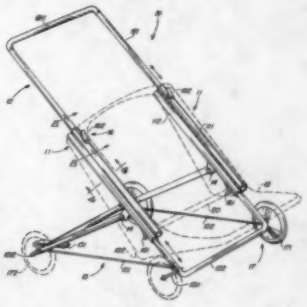
1. A support structure having wheels for baby support and containment means, such as a seat or a carry-cot, to form with these a push chair or a perambulator, substantially comprising a pair of flat side frames between which the said means are disposed, and which are connected together by a plurality of crosspieces, characterized by the fact that each of the said side frames substantially comprises a first (**2**) and a second shaft (**3**) pivotally connected together in relative angular configuration by means of a first pivot (**4**) and to each of said shafts there is connected one of said wheels (**5**), a slide (**6**) which is slidable on the first of said shafts, a connection element (**7**) having one end connected by means of a second pivot (**8**) to said slide and the other end connected by means of a third pivot (**9**) to said second shaft at a point intermediate between said first pivot and the associated wheel, a third shaft (**19**) having one end connected by means of a fourth pivot (**20**) to said first shaft at a point located to one side of said first pivot and the other end connected to a handle, said third shaft being connected to said slide by means of a fourth shaft (**23**) one end of which is connected by means of a fifth pivot (**24**) to said third shaft and the other end of which is connected by means of said second pivot to said slide in such a way that upon rotation of said third shaft with respect to said first shaft there is produced a displacement of said slide on the first shaft and therefore an associated rotation of said first and second shaft to change the relative angular configuration of the shafts themselves; said structure further including rigid baby support and containment means (**21**); two bars (**33**) each of which is fixed to one of said sliders, said bars being adapted to support said rigid baby support and containment means; the length of said shafts and of said connection element, and the relative positions of said pivots being selected such that said structure can assume a first or working configuration in which said third and fourth shafts are aligned and superimposed with said first shaft and said first and second shafts form between them a first predetermined angle, and a second configuration for transport, which is obtained by making said third shaft rotate with respect to the first shaft through an angle slightly less than 180° and in which said first and second shafts form between them a second predetermined angle smaller than said first predetermined angle and said two wheels connected to the shafts themselves are substantially in contact with one another; said structure further including means (**28**) for locking said third and fourth shafts with respect to said first shaft when the structure is located in said first or working configuration.

4,412,689

FOLDING SUPPORT FRAME FOR STROLLER OR THE LIKE

Byron D. Lee, 5010 Cactus Pl., Prescott, Ariz. 86301

Filed Apr. 30, 1981, Ser. No. 259,033
Int. Cl.^{3} B62B *7/08, 7/12*
U.S. Cl. 280—648 **20 Claims**



1. A folding support frame comprising:
a pair of dual conduit slide means;
first and a second U-shaped slide members each slidably coupled to each one of said pair of dual conduit slide members to form a generally rectangular framework of selectedly variable size; and
a U-shaped rotating support member pivotally coupled to said pair of dual conduit slide means for rotation at the open end of the U-shaped rotating support member about an axis transverse to said pair of dual conduit slide means.

4,412,690

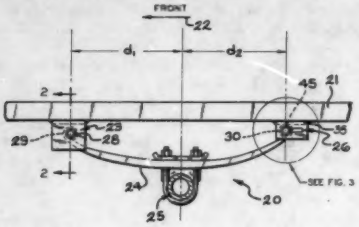
SUSPENSION SYSTEM

B. Robert Prokop, and Terry L. Trindle, both of Elkhart, Ind., assignors to Kelsey-Hayes Co., Romulus, Mich.

Filed Apr. 22, 1981, Ser. No. 256,352
Int. Cl.^{3} B60G *5/04*
U.S. Cl. 280—718 **4 Claims**

1. In a vehicle suspension system including a spring means extending between a first and second vehicle attachment means and having axle means attached to said spring means between said first and second vehicle attachment means, the improvement wherein at least one of said vehicle attachment means includes a generally parallel pair of guides defining therebetween a load-transferring surface, wherein said pair of guides have corresponding slots therein extending generally parallel with said load-transferring surface, and pin means protruding from said spring means end and through said slots, said spring

means having one end thereof in load-transferring slidable engagement with said load-transferring surface and thereby



restrained between said pair of guides, said load-transferring surface and said spring means end having complementary lateral cross-sectional configurations.

4,412,691

DOOR MOUNTED SEAT BELT RETRACTOR

James E. Murphy, Royal Oak, and Kenneth H. Reid, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 15, 1981, Ser. No. 273,575
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—803 **2 Claims**

1. A seat belt retractor adapted for mounting on a door hingedly mounted for movement between positions opening and closing a door opening defined by a door frame and comprising:

a retractor frame mounted on the door and having a pendulum support means;

a reel rotatably journaled on the retractor frame and having ratchet teeth thereon;

a lock bar pivotally mounted on the retractor frame for movement from a normal disengaged position to a locking position engaged with the reel ratchet teeth to lock the reel against belt unwinding rotation;

a pendulum having a head mounted on the pendulum support means of the retractor frame to engage the lock bar and an inertia weight movable from a normal position by an inertia stimulus to move the lock bar to the engaged position;

feeler means mounted on the door for sensing movement of the door from the closed position; and

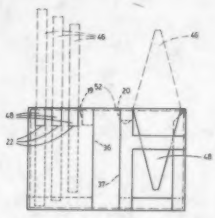
a flexible element having one end attached to the feeler means and the other end attached to the inertia weight of the pendulum, said flexible element having a normal tensionless condition when the door is closed so that the pendulum is free for movement by in inertia stimulus to move the lock bar to the engaged position, said flexible element being tensioned by the feeler means in response to door movement from the closed position so that the flexible element restrains the pendulum against movement from the normal position by an inertia stimulus induced by door opening movement.

4,412,692

APPLIANCE FOR A BOOK OR THE LIKE

Donald E. Williams, 2479 S. Poppy, Fresno, Calif. 93706

Filed Feb. 17, 1981, Ser. No. 234,767
Int. Cl.³ B42D *3/04, 3/18, 9/00*
U.S. Cl. 281—34 **1 Claim**



1. An appliance for a book or the like having a multiplicity of pages bound together along a spine and enclosed by a primary cover, the appliance comprising:

A. a flexible, substantially rectangular outer panel dimensioned to be disposed in covering relation to the primary cover, the outer panel having substantially parallel opposite lateral edges at opposite ends thereof and substantially parallel marginal edges substantially normal to said lateral edges;

B. a first inner panel secured in facing relation to said outer panel and adapted to receive a portion of said primary cover between the outer panel and the first inner panel;

C. a second inner panel secured in facing relation to the outer panel and adapted to receive a portion of said primary cover between the outer panel and the second inner panel; and

D. a plurality of elongated flexible members borne by the appliance in spaced relation to each other along a marginal edge, said members individually having free ends adapted for interposition between selected adjacent pages of said book, one of said inner panels having a plurality of slots therein positioned and dimensioned individually to receive the free ends of said flexible members in stored positions.

4,412,693

SWIVEL HOSE COUPLING WITH THREADED NIPPLE

Sergio Campanini, 224 E. Miller Rd., Iola, Kans. 66749

Filed Jul. 31, 1981, Ser. No. 288,710
The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.
Int. Cl.³ F16L *33/22*
U.S. Cl. 285—39 **6 Claims**

1. A swivel coupling for terminating the end of a resilient hose having a bore therethrough, the coupling comprising:

(a) a tubular nipple having a central opening therethrough and having an outer surface including a cylindrical portion near one end and a hose receiving portion near the

other end, the hose receiving portion having a threaded end of diameter slightly greater than the diameter of the hose bore and having an annularly barbed portion between the threaded end and the cylindrical portion, and the central opening through the nipple having therewithin female wrench flats in the vicinity of said cylindrical portion;

(b) a screw fitting having a passage therethrough with a cylindrical wall portion snugly receiving the cylindrical portion of the nipple, and the fitting having a threaded portion extending away from said hose receiving portion of the nipple.

(c) interfering means carried by the fitting and by the nipple and operative to keep the fitting rotatably engaged on said cylindrical portion of the nipple; and

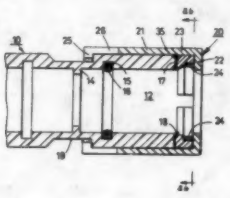
(d) means for surrounding the hose and the hose receiving portion of the nipple to compress the hose on said annular barbed portion.

4,412,694

CLAMPING DEVICES PARTICULARLY USEFUL AS PIPE COUPLINGS

Avner Rosenberg, Moshav Beit Shearim, Israel

Filed Sep. 25, 1980, Ser. No. 190,721
Int. Cl.³ F16L *37/18*
U.S. Cl. 285—178 **11 Claims**



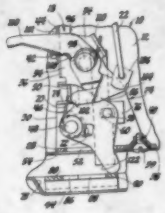
1. A clamping device particularly useful as a pipe coupling, comprising a housing having a bore through one end face for receiving the pipe to be coupled, and a cap rotationally mounted over the housing end face and including a skirt enclosing the housing, and an end wall having an aperture therethrough for the pipe to be coupled; characterized in that said device further includes a plurality of interposer elements comprising a pair of clamping segments interposed between said end face of the housing and the inner face of the cap end wall on opposite sides of the aperture; each of said clamping segments having a convexly-curved outer face, and a concavely-curved inner edge engageable with the outer face of the pipe to be coupled, said cap including displacing means effective upon rotation of the cap to one position, to displace said clamping segments along a rectilinear path radially inwardly to grip the pipe when inserted into the housing, and upon rotation to a second position, to displace said clamping segments radially outwardly to release the pipe; said displacing means comprising cam surfaces, constituted by radially-extending high points and low points formed on the inner face of said skirt, engageable with the outer convex faces of said clamping segments effective to displace said segments radially inwardly upon the rotation of said cap; the inner edges of said clamping segments engageing substantially the complete circumference of the pipe, and being sharpened for biting into the pipe, when the pipe is received within the housing and the clamping segments are actuated to their clamping positions.

4,412,695

SLIDE BOLT LATCH ASSEMBLY

Alfonsas Arlauskas, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 12, 1981, Ser. No. 224,312
Int. Cl.³ E05C *1/12*
U.S. Cl. 292—173 **3 Claims**



1. A slide bolt latch assembly for releasably securing a door to a vehicle or the like comprising,

a thin cam lever pivotally mounted on the door for movement between an extended position and a retracted position, the cam lever including a substantially linear leading edge,

means biasing the cam lever toward its extended position,

a thin slide bolt linearly movable between extended and retracted positions,

means coupling the cam lever and the slide bolt for concurrent movement between extended and retracted positions,

means locating the cam lever and slide bolt in their extended positions such that the slide bolt and cam lever leading edge are substantially parallel,

striker means associated with the vehicle and having a leading edge portion and a second edge portion respectively engageable by the cam lever and slide bolt when in their extended positions,

the leading edge portion being engageable by the cam lever leading edge as the door is partially closed to concurrently move the cam lever and slide bolt to their retracted position against the force of the biasing means, disengagement of the cam lever leading edge from the striker leading edge portion and subsequent movement of the cam lever to its extended position under the biasing means engaging the slide bolt with the second edge portion to maintain the door in closed position, and

release means for concurrently moving the cam lever and slide bolt to their retracted position wherein the slide bolt is disengaged from the second edge of the striker means allowing the door to be opened.

4,412,696

DOOR HANDLE DEVICE FOR AN AUTOMOTIVE VEHICLE

Katsumi Ishii, Tokyo, and Takayo Chikaraishi, Kawasaki, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

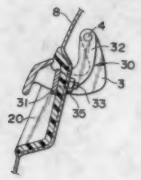
Filed Jun. 18, 1981, Ser. No. 274,766
Claims priority, application Japan, Jul. 29, 1980, 55-103027
Int. Cl.³ E05C *13/00*
U.S. Cl. 292—336.3 **7 Claims**

1. A door handle device for an automotive vehicle which comprises:

(a) a door panel having a recessed portion provided with two arm-admitting holes and a cylinder hole,

(b) a handle box having two arm-admitting holes and a cylinder hole, said handle box being almost the same in shape as the recessed portion of said door panel so that almost the whole outside surface of said handle box can be closely brought into contact with the recessed portion of said door panel;

(c) a handle bracket having two arm portions and a flat portion, said handle bracket being fixed to the recessed portion of said door panel with said handle box sandwiched between the flat portion of said handle bracket and the recessed portion of said door panel, the two arm portions being passed through the two arm-admitting



holes of said handle box and the recessed portion of said door panel; and

(d) a handle body for unlocking the door, said handle body being rotatably supported by said handle bracket,

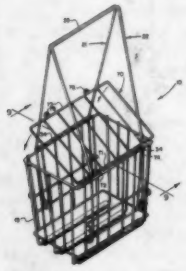
whereby no bending or shearing force is applied to said handle box when said handle body is rotated to unlock the door.

4,412,697

TENNIS BALL RETRIEVING STORAGE CONTAINER

John Verde, P.O. Box 31249, Dallas, Tex. 75231

Filed Apr. 17, 1981, Ser. No. 255,053
Int. Cl.³ A63B *47/02*
U.S. Cl. 294—19 A **2 Claims**



1. A tennis ball retrieving apparatus for receiving tennis balls from a playing surface and storing said balls for subsequent use, said apparatus comprising:

a container having an open top, side and end walls, and a bottom including a plurality of parallel rods spaced from one another a distance greater than the diameter of a ball to be retrieved;

a pair of cylindrical rollers formed of a resilient material which will not mar a tennis ball playing surface upon frictional engagement therewith, each of said rollers being positioned loosely about each of the bottom rods for movement upon the rods and having a wall-thickness sufficient to prevent contact between the bottom of the container and the playing surface, the spacing between opposing inside surfaces of adjacent ones of said rollers being slightly less than the diameter of a ball to be retrieved and stored within the container;

means for supporting said container above balls resting on a playing surface for the forced manipulation of said container downwardly over said balls and the passage of said balls between adjacent ones of said rollers for retrieval; and

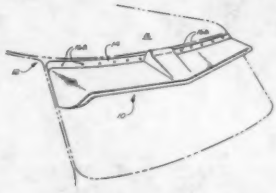
a pair of handles hingedly mounted to opposite side walls of said container for rotating between an upwardly and downwardly extending position, wherein said handles include elongated hook portions which hingedly connect to said container side walls for allowing transverse and rotational movement relative to said container, and wherein each of said handles further includes at least one hook member disposed upon said handle for engaging and securing said container through transverse movement of said handle relative to said container and the upstanding support thereof when said handle is in a downwardly rotated position.

4,412,698

METHOD AND APPARATUS FOR ATTACHING SUN VISOR TO AN AUTOMOBILE

Michael C. Kingsley, 2221 Ross Way, Tacoma, Wash. 98421

Filed Aug. 18, 1981, Ser. No. 294,042
Int. Cl.³ B60J *3/00*
U.S. Cl. 296—97 A **6 Claims**



1. A method of joining a visor to an automobile structure at a fastening location where there is relative movement between the two members, said visor being made of a more yielding material, such as plastic, said method comprising:

a. providing a fastening member comprising a sleeve having a forward deformable end portion and a rear portion with a flange having a forward bearing surface, and an elongate expanding member positioned within the sleeve and having a forward expanding head, said sleeve having a predetermined diameter,

b. positioning said visor at a position to be joined to said structure,

c. forming a pair of matching holes in said visor and said structure, with the hole in the visor having a diameter sufficiently greater than the diameter of the sleeve to permit relative lateral motion between the fastener and the visor when the fastener is placed in the hole of the visor,

d. placing an insert onto said fastener, said insert having a forward bearing surface to press against the visor and a rear surface to engage said flange,

e. inserting the fastening member into the two holes,

f. moving said expanding member in a rearward direction with a force sufficient to deform the forward end portion of the sleeve, and pressing said flange against said insert so that the insert presses against the first member, thus securing the visor to the automobile structure, with the relative movement between the visor and the structure being permitted.

4,412,699

MODULAR FRAME FOR TIPPING BODIES OF TRUCKS ADJUSTABLE IN WIDTH

Luigi Peruzzi, Rome, Italy, assignor to Officine Romanazzi S.p.A., Rome, Italy

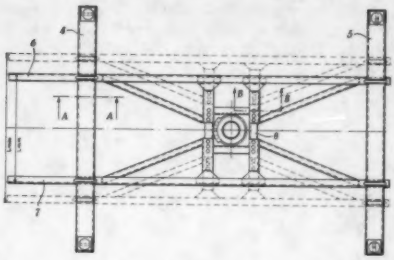
Filed Jun. 10, 1981, Ser. No. 272,409
Claims priority, application Italy, Aug. 13, 1980, 49490 A/80
Int. Cl.³ B60P *1/28*; B62D *21/12*
U.S. Cl. 298—17.7 **3 Claims**

1. A modular frame for dump trucks having two parallel side members and two parallel cross members adjacent the end portions of said side members, comprising

(a) two pairs of U-shaped half cross members, each pair

being rigidly secured to each of said side members substantially at the central portion thereof;

(b) a central cross unit carrying a base for a hoisting jack and adapted to be adjustably connected with said half cross members of each of said side members; and



(c) disengageable fastening means for adjustably connecting said two cross members to the end portions of said side members.

4,412,700

SYSTEM FOR MONITORING THE MOVEMENT OF A CUTTING TOOL OF A TUNNEL-DRIVING MACHINE RELATIVE TO A DESIRED PROFILE

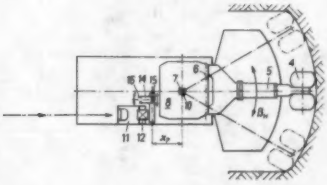
Alfred Zitz, Zeltweg; Erich Dröscher, Scheifling, and Otto Schetina, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Apr. 20, 1981, Ser. No. 255,636

Claims priority, application Austria, Apr. 21, 1980, 2138/80; Oct. 14, 1980, 5102/80; Oct. 14, 1980, 5103/80

Int. Cl.³ E21D *9/10*

U.S. Cl. 299—1 **17 Claims**



1. In a tunnel-driving machine having a cutter arm mounted at one end on the machine by means of a swiveling mechanism which pivots the cutter arm for swinging movement about a horizontal axis and a vertical axis and a rotatable cutting tool carried by the other end of the cutter arm for engagement with the breast of a tunnel; a system for monitoring the movement of the cutting tool comprising means for generating a focussed electromagnetic wave train aligned with the tunnel axis; a wave train reciever; means mounting the receiver for displacement transversely to the longitudinal axis of the machine and for pivotable movement between a position in which the receiver is parallel to the longitudinal axis of the machine to a position aligned with the wave train axis; a simulator which includes a three-dimensional model of that part of the desired tunnel profile adjacent the breast of the tunnel, a three-dimensional model of the cutter arm and cutting tool mounted on a three-dimensional model of the swiveling mechanism, an adjusting drive for swinging the cutter arm model analogously to the cutter arm; means mounting the swiveling mechanism model for displacement and/or pivotal movement, an adjusting drive for the swiveling mechanism model; sensors for detecting the displacement and/or pivotal angle of the receiver and the cutter arm; and means responsive to the sensors for controlling the adjusting drives.

4,412,701

HYDRAULIC BRAKE SYSTEM

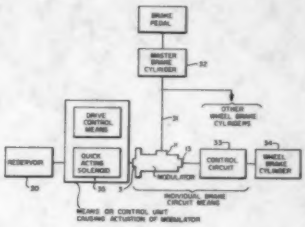
Manfred Burckhardt, Waiblingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 236,224

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006137

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—6 R **14 Claims**



1. A hydraulic brake system having at least a single circuit for a motor vehicle, the brake system including a brake pedal means, a master brake cylinder means, a plurality of wheel brake cylinders, and individual brake circuit means for connecting the master brake cylinder means with the respective wheel brake cylinders, a pressure modulator means disposed in each of the individual brake circuit means between the master brake cylinder means and the respective wheel brake cylinders, wherein means are provided for causing an actuation of the pressure modulator means so as to enable a building up of a pressure in the individual brake circuit means when the brake system is not operated by the brake pedal means, and characterized in that the pressure modulator means includes a stepped housing means, a stepped piston adapted to the housing means is displaceably mounted in the housing means, the stepped piston includes a large piston portion and a small piston portion, a pair of axially spaced sealing means are disposed on the small piston portion, means are provided for connecting the housing means with the master brake cylinder means, one of said sealing means is adapted to selectively open and close the means for connecting the housing means with the master brake cylinder means, a first pressure chamber means is provided in the housing and is cooperable with the large piston portion, a second pressure chamber means is provided in the housing means for the small piston portion, means are provided for connecting the second pressure chamber to the individual brake circuit means, and in that means are provided for connecting the first pressure chamber means with the means for causing an actuation of the pressure modulator means.

4,412,702

FLUID PRESSURE PROPORTIONING VALVE AND PLUG MEMBER THEREFOR

Lloyd G. Bach, South Bend, Ind., and Robert F. Gaiser, Stevensville, Mich., assignors to The Bendix Corporation, Southfield, Mich.

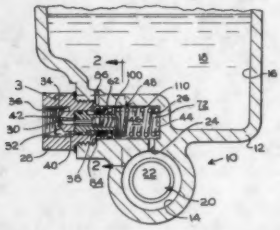
Filed May 21, 1981, Ser. No. 265,945

Int. Cl.³ B60T *8/26, 11/34*

U.S. Cl. 303—6 C **3 Claims**

1. A fluid pressure proportioning valve comprising a housing defining a bore therein, first passage means for communicating pressurized fluid from a source thereof into said bore, second passage means for communicating pressurized fluid from said bore to a fluid pressure responsive device, a differen-

tial-area piston member movably received in said bore and dividing the latter into a pair of chambers, one of said chambers communicating with said second passage means, third passage means for interconnecting said pair of chambers, valve means for opening and closing said third passage means to respectively establish and interrupt fluid communication between said fluid source and said device in response to movement of said piston member, resilient means for biasing said piston member toward a first position wherein said valve means opens said third passage means, said piston member moving axially to a second position in response to a prescribed fluid pressure level in said pair of chambers to close said third passage means via said valve means, said piston member shuttling axially between said first and second positions in response to fluid pressure in said one chamber increasing above said prescribed pressure level to proportion pressurized fluid to said device via said other chamber, characterized in that said housing includes a plug member defining a portion of said bore, said bore portion receiving a portion of said piston member, said plug member further defining an abutment surface forming a



manufacturing reference for measuring dimensions of said piston member and said valve means, said piston member engaging said abutment surface to define a rest position for said piston member, said piston member further including an axially extending bore receiving said valve means and defining said third passage means, said valve means including an operating stem extending axially in said axially extending bore and engageable with said abutment surface to define a rest position for said valve means whereby said abutment surface cooperates with both said valve means and said piston member to open said valve means when said piston member and said operating stem are in said rest position engaging said abutment surface, said valve includes an annular bearing member received in said bore portion and secured to said plug member, said bearing member slidably receiving a small diameter part of said piston member and defining an abutment surface confronting a shoulder formed by a large diameter part on said piston member, said shoulder engaging said abutment surface of said bearing member to prevent removal of said piston member from said bore portion.

4,412,703

DRAWER SLIDE SYSTEM

Jorgen R. Simonson, 8441 Millbridge Cir., Huntington Beach, Calif. 92646

Filed Dec. 10, 1981, Ser. No. 329,394

Int. Cl.³ F16C *21/00*

U.S. Cl. 308—3.6 **9 Claims**

1. A slide and interfitting track system for a drawer, and the like, manufactured from an injection molded plastic material, comprising:

A.

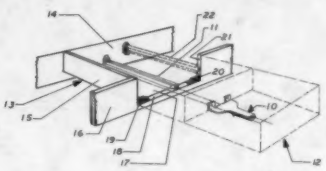
i a generally T-shaped, flat drawer support portion defining leading and trailing edges;

ii. at least one flange rearwardly of the support and integral with the trailing edge;

iii. means for attaching the flange and support portion to the drawer;

iv. forward and rear longitudinally aligned slide runners disposed centrally under the support and integral therewith at the leading and trailing edges, respectively, each slide runner and support edge defining an I-beam shaped cross section, including a channel portion defined on each side of the runner when viewed longitudinally along the slide runner;

B. a slide track defining a bottom portion and generally U-shaped, inwardly folded rail members adapted to interfit with the slide runners for movement therealong; and,



C. end mountings provided for the track, comprising an end piece insertable into the slide track, the end piece including a first and second set of spaced apart twin members, each set of members being oriented at right angles to each other, and an interfitting base member for the end piece mounted centrally under the drawer, the base member defining a horizontal channel adapted to interlock with a set of twin members of the end piece.

4,412,704

COUPLING MECHANISM

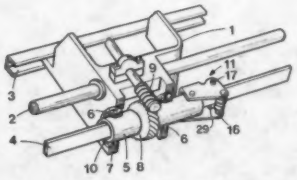
Gustave Gagnebin, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed May 5, 1981, Ser. No. 260,804

Claims priority, application Switzerland, May 20, 1980, 3915/80

Int. Cl.³ F16C *29/12*

U.S. Cl. 308—6 R **8 Claims**



1. A coupling mechanism between a rotatable part which is displaceable along its axis of rotation and a rod pivotal about its longitudinal axis and extending through an axial passage of the rotatable part, comprising an angular coupling member between the part and the rod, said coupling member being pivotally mounted on the rotatable part about a pivotal axis at right angles to the axis of rotation of the rotatable part and including a part slidingly mounted on the rod and angularly secured with said rod, said coupling member, rotatable part and rod being disposed in such a manner to permit a relative displacement between said rod and said rotatable part following a direction substantially parallel to the pivotal axis.

4,412,705
BEARING ASSEMBLY FOR TRANSMISSION OUTPUT SHAFT

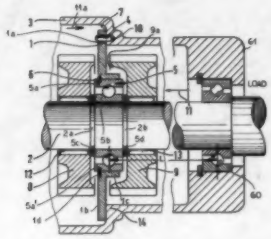
Friedrich Schreiner, Kehlen, and Uwe Staberoh, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,408

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 3044050

Int. Cl.³ F16C *35/06*

U.S. Cl. 308—178 **9 Claims**



1. In a transmission having a housing, an output shaft journaled in an end of said housing and extending into said housing, and at least one gear on said output shaft in said housing, said output shaft having a free end beyond said gear, the improvement which comprises a bearing assembly in said housing, said bearing assembly including a rolling bearing on said shaft between said free end and said gear, a holding plate receiving and carrying said bearing, and means connecting said holding plate to said housing, said means including a shoulder formed on said housing and contacting one face of said plate whereby said plate is fixed and supported by said shoulder in one axial direction of said output shaft, and further including means for holding said plate against rotation relative to said shoulder whereby said plate is free from attachment to the housing in the opposite axial direction of the output shaft and said plate is free to move axially with said shaft relative to the housing in the said opposite axial direction.

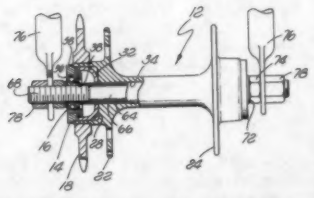
4,412,706
BICYCLE SEALED BEARING AND METHOD

Willard C. Hopper, Jr., 4850 Trail, Norco, Calif. 91760

Filed Jan. 23, 1981, Ser. No. 227,642

Int. Cl.³ F16C *33/00*

U.S. Cl. 308—192 **1 Claim**



1. A combined sealing bearing unit having an inner race and outer race pre-formed in a generally cylindrical collar for mounting in a bicycle wheel hub bore comprising:

an inner bore formed in said collar terminating at an interior shoulder wherein said sealed bearing unit outer race abuts said interior shoulder, said interior shoulder formed in a plane perpendicular to said inner bore axis, said interior shoulder facing in a first direction;

said cylindrical collar further comprising a first reduced diameter and a second reduced diameter section; said first and second reduced diameter sections being axially aligned with said inner bore axis, said first and second reduced diameter sections each terminating at one end at a central shoulder formed in a plane parallel to said interior shoulder and facing in a second direction; said first reduced diameter section terminating at its second end at a second shoulder facing in said second direction, for enabling said first reduced diameter section to form a tight fit in said bicycle wheel hub bore and said second reduced diameter section to be spaced from an irregular surface in said hub bore.

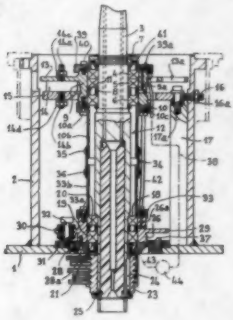
4,412,707
BEARING DEVICE FOR CENTRIFUGE

Denis Buffet, Meyzieu, France, assignor to Robatel SLPI, Genas, France

Filed Dec. 30, 1981, Ser. No. 336,108

Int. Cl.³ F16C *27/00, 35/08*

U.S. Cl. 308—228 **2 Claims**



1. In a centrifuge,

(a) a vertical shaft;

(b) a frame having a base plate, and having a sleeve supported by the base plate and surrounding the shaft;

(c) upper and lower bearing assemblies comprising vertically spaced upper and lower cylindrical bodies surrounding the shaft within the sleeve and respectively carrying bearings supporting the shaft;

(d) an upper non-rotating annular member within the sleeve surrounding the shaft and the member having vertical columns depending therefrom and resting on the base plate;

(e) elastic mounting means supporting the upper cylindrical body on the upper non-rotating annular member;

(f) a lower non-rotating annular member surrounding the shaft and supported on the base plate;

(g) elastic mounting means supporting the lower cylindrical body on the lower non-rotating annular member;

(h) tubular means surrounding the shaft in spaced relation thereto and connected with the upper and lower cylindrical bodies to form with the shaft an intermediate oil conducting space between the bearings in the bodies; and

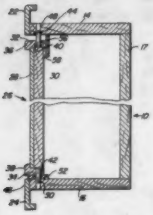
(i) centering means comprising at least three screws extending radially through the sleeve opposite the periphery of the upper annular member and adjustably engaging the upper annular member to keep it centered in the frame.

4,412,708

CABINET DOOR HINGE CONSTRUCTION

James J. Palka, Arlington Heights, Ill., assignor to Pace Industries Inc., Chicago, Ill.

Filed Sep. 21, 1981, Ser. No. 303,898
Int. Cl.[3] E05D 5/10, 7/08
U.S. Cl. 312—138 R 2 Claims



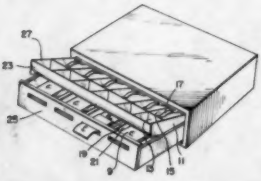
1. A door hinge construction for cabinets having an open front, said cabinet and door each having top and bottom walls, said door having a lengthwise dimension less than the area between the top and bottom walls of the cabinet, nylon dowels rods partially mounted in said door in alignment with each other adjacent one side thereof and on the top and bottom walls of said door, and having portions of said dowel extending beyond said top and bottom walls, aligned bores in said cabinet, top and bottom walls aligned with said dowel rods, and a thick washer on said lower dowel rod whereby when the door is tilted away from the cabinet walls, the upper dowel rod is inserted in the bore of the top wall and by raising the door in the aforesaid area, the lower dowel rod with the washer is placed in the bore in the bottom wall.

4,412,709

DIVIDED CASH DRAWER WITH SLOTS AND TWO TRAYS

Shiro Ishii, Stanton, Calif., assignor to M-S Corporation, Stanton, Calif.

Filed Oct. 28, 1980, Ser. No. 202,178
Int. Cl.[3] A47B 88/00; G07G 1/00
U.S. Cl. 312—291 2 Claims



1. A cash receptacle for storing different types of media, said receptacle comprising:

an outer case having an opening in one side thereof;

a drawer slidably received within said case through said opening therein;

said drawer having in the bottom thereof a plurality of dividing supports partitioning said bottom of said drawer into a plurality of drawer compartments including one large compartment having adjustable means for dividing said large compartment into two compartments, two smaller compartments located adjacent said large compartment, and a coin compartment located behind said two smaller compartments within said drawer;

a money tray removably supported in said drawer on said dividing supports;

said drawer having in a front wall thereof a plurality of slots including a slot corresponding to said large compartment and two individual slots corresponding to said two smaller compartments, said slots being located in said front wall at a level above the respective said drawer compartments and facing a front wall of said money tray; and

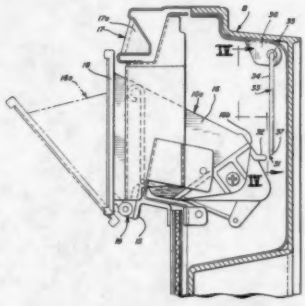
said front wall of said money tray being curved downwardly and rearwardly from the top front of said money tray, thereby forming means for guiding media inserted through said slots into respective said drawer compartments beneath said money tray.

4,412,710

GRAVITY-OPERATED LATCH FOR TILT-OUT CONSOLE FOR DISHWASHER

Paul J. Laprad, Lincoln Township, Berrien County, and Gerald L. Wolanin, Baroda Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 10, 1981, Ser. No. 272,385
Int. Cl.[3] A47B 96/00
U.S. Cl. 312—311 10 Claims



1. In a dishwasher having a cabinet defining a vertical access opening, an access door having a control panel assembly for mounting a console and a lower portion hingedly mounted to the cabinet at the bottom of said opening to be swung selectively about a pivot axis of the hinged mounting between a vertical, closed position wherein the door closes said access opening to an outwardly tilted, open position wherein the access opening is open, a control console for operation by the user of the dishwasher for controlling dishwashing operation thereof, a tilt-out door for selectively covering the control console, means for pivotally mounting said tilt-out door to said control panel assembly of said access door, and biasing means for lightly biasing said tilt-out door to a closed position covering said control console and permitting the user to swing the tilt-out door outwardly from said closed position to an open position exposing the control console for access by the user, the improvement comprising

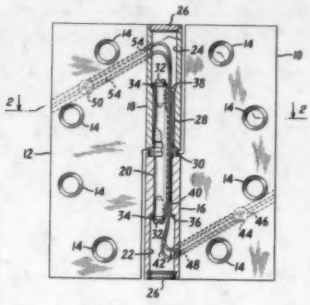
stop means associated with said access door and said tilt-out door responsive to swinging of said access door beyond a small preselected angle from said closed position for preventing pivoting of said tilt-out door by gravity substantially from its closed position against the biasing action of said biasing means and preventing the user from swinging the tilt-out door to its open position when the access door is so swung beyond said preselected angle while permitting free pivoting of the tilt-out door by the user to its open position against said biasing action when the access door is less than said preselected angle from said closed position thereof.

4,412,711

TWO KNUCKLE ELECTRICAL HINGE

Charles R. Suska, Roxbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Dec. 3, 1981, Ser. No. 327,181
Int. Cl.³ H01R 39/00
U.S. Cl. 339—4 16 Claims



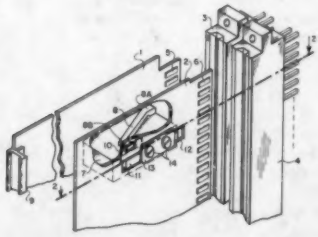
1. A hinge for mounting a door in a frame and for passing electric current between the door and frame through a concealed, tamperproof electrical wire comprising a first hinge leaf having a first hinge knuckle, a second hinge leaf having a second hinge knuckle, said first and second knuckles having axially aligned bores, a solid hinge pin disposed in the bores of said first and second knuckles and having a slot extending between the bores of said first and second knuckles for receiving a wire, first conduit means in said first leaf and knuckle for passing a wire from said first leaf to said slot, and second conduit means in said second leaf and knuckle for passing a wire from said slot to said second leaf.

4,412,712

CIRCUIT BOARD POSITIONING ARRANGEMENT

William A. Reimer, Wheaton, and Ansano Bertellotti, Addison, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Oct. 23, 1981, Ser. No. 314,169
Int. Cl.³ H01R 23/72
U.S. Cl. 339—17 M 10 Claims



1. A circuit board positioning arrangement for use with at least two circuit boards, each board including a connector engaging edge portion, each of said edge portions sequentially positionable in contact with an associated connector, a first one of said boards initially located farther from its associated connector than a second one of said boards is from its associated connector, said positioning arrangement comprising:

receiving means included in at least one of said boards;

support means adapted to position and maintain said boards in parallel and spaced relationship while permitting lateral movement of at least one of said boards relative to another; and

sequencing means included in at least another one of said boards and initially positioned in contact with said receiving means;

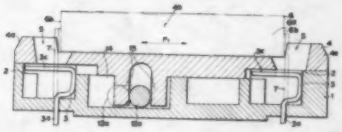
whereby, said second board initially located closer to its associated connector is placed in contact with its associated connector in response to the initial application of force to said first board, and in response to the continued application of said force to said first board, said sequencing means is repositioned relative to said receiving means and said first board is positioned in contact with its associated connector.

4,412,713

SOCKET HAVING MEANS OF NO-LOAD ENGAGING WITH AND RELEASING FROM IC PACKAGE

Kinichi Nishikawa, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,477
Int. Cl.³ H01R 13/54
U.S. Cl. 339—75 M 1 Claim



1. A socket for a substantially rectangular IC package having lengthwise extending parallel rows of depending lead wires, said socket comprising:

a rectangular base plate having two lengthwise extending parallel rows of contact receiving vertical openings with the rows spaced the same distance as the rows of lead wires and with the openings in the rows spaced at the same distance apart as the leads on said IC package, and each opening having a contact therein for being engaged by a corresponding lead wire from the IC package when the IC package is assembled with the socket;

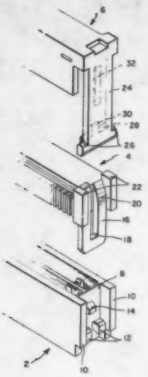
a substantially rectangular movable plate having two lengthwise extending parallel rows of through openings corresponding with the rows of vertical openings in said base plate and having the through openings aligned with the corresponding vertical openings in the base plate, said through holes and said vertical openings having a larger cross-section than the depending lead wires on the IC package for permitting the lead wires to pass freely through said through holes and into said vertical openings when the IC package is assembled with the socket, said movable plate being movably mounted on said base plate for movement only in a direction transversely to the length of said rows of openings and through holes; and

means for moving said movable plate on said base plate in said direction between a lead wire released position in which the lead wires are out of contact with said contacts and a lead wire engaged position in which the lead wires are engaged with said contacts, each contact opening in the direction toward the direction from which said movable plate is moved by said moving means toward said contact engaged position, said movable plate further having two parallel lengthwise extending walls thereon extending parallel to said rows of openings and spaced a distance from each other equal to the width of the IC package, whereby when the IC package is assembled with the socket, the IC package is placed between said walls and the force exerted on the IC package and the depending lead wire during the movement of said movable plate is solely through the sides of the IC package.

4,412,714
LATCHING CONNECTOR ASSEMBLY

Leroy J. Morningstar, 3 Speyer Rd., Middletown, Pa. 17057, and Charles Tighe, Jr., 987 Beech Ave., Hershey, Pa. 17033

Filed Jun. 13, 1980, Ser. No. 159,026
Int. Cl.³ H01R *13/627*
U.S. Cl. 339—91 R 10 Claims



1. A latching assembly for a multipiece connector comprising:

first elongate side surface means recessed between two longitudinal, outwardly directed edge flanges, said first side surface means having profiled retention protuberance means projecting outwardly between said edge flanges:

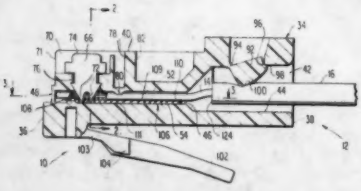
second elongate side surface means having a T-shaped cantilever spring finger projecting outward, tangentially therefrom, said spring finger having an inwardly directed transverse flange at a forward end, and an inwardly directed camming protuberance located rearward and adjacent said flange, said flange latchingly engaging over said retention protuberance means and said camming protuberance disposed between said retention protuberance means as said spring finger is inserted between said edge flanges, and

said spring finger having outwardly directed ear portions at a forward end for latchingly engaging over forward ends of said edge flanges.

4,412,715
MODULAR ELECTRICAL PLUG INCORPORATING CONDUCTIVE PATH

Stephen B. Bogese, II, Salem, Va., assignor to Virginia Patent Development Corp., Roanoke, Va.

Filed Jan. 12, 1981, Ser. No. 224,019
Int. Cl.³ H01R *31/08*
U.S. Cl. 339—97 P 44 Claims



1. An electronic connector, which comprises:

a dielectric housing;

conductive wire means positioned in said housing;

electrically conductivve contact means positioned in said housing for piercing said conductive wire means for permitting an electrical connection to be made thereto externally of said housing; and

substrate means positioned in said housing and having an electrically conductive path positioned thereon;

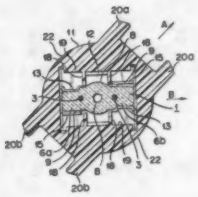
wherein said conductive wire means comprises a plurality of insulated conductors and said contact means comprises a plurality of insulation-piercing contact terminals, certain of said terminals piercing and thereby making electrical connection with an associated one of said insulated conductors; and

wherein said substrate means is positioned adjacent said plurality of conductors and wherein said path includes at least one electrically conductive segment which is adjacent the portion of one of said conductors which is pierced by its associated contact terminal so that said segment is also pierced thereby.

4,412,716
SOCKET FOR BASELESS INCANDESCENT LAMP

Masaharu Baba, Yokohama, and Kiyokazu Honda, Zushi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 30, 1980, Ser. No. 173,752
Claims priority, application Japan, Aug. 1, 1979, 54-97241
Int. Cl.³ H01R *13/48*
U.S. Cl. 339—176 L 13 Claims



1. A socket for holding and effecting electrical contact with the terminals of a baseless incandescent lamp of the type comprising a light transmitting container having a squeezed portion with an exhaust tube, a filament contained in said container, and a pair of lead-in wires each having one end connected to said filament and the other extending to the outside through said filament and the other extending to the outside through said squeezed portion so that said pair of lead-in wires may be turned up along the squeezed surfaces of said squeezed portion to form terminals, said socket comprising:

a socket body having a receiving portion defining a rectangular section including an opposing pair of inner side faces for receiving the squeezed portion of said baseless incandescent lamp;

a pair of terminal members attached to said socket body for effecting electrical contact with said terminals of said incandescent lamp when said squeezed portion of said incandescent lamp is received in said receiving portion; and

first and second symmetrical pairs of ribs integrally formed with said socket body, said first pair protruding from a predetermined one of said inner side faces, and said second pair protruding from the other of said inner side faces, said first and second pairs disposed in said receiving portion intermediate said exhaust tube and said terminals when said incandescent lamp is received in said receiving portion, the projected edges of said ribs elastically engaging said squeezed portion in the vicinity of said exhaust tube, the projected edges of each set of diagonally opposing ribs of said first and second rib pairs capable of being disposed between said exhaust tube and the terminals of said incandescent lamp regardless of lamp orientation upon insertion

into said receiving portion, thereby preventing said terminals from moving toward said exhaust tube.

4,412,717

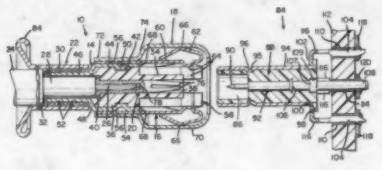
COAXIAL CONNECTOR PLUG

Kevin T. Monroe, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 21, 1982, Ser. No. 390,427

Int. Cl.³ H01R *13/62, 17/18*

U.S. Cl. 339—177 R **5 Claims**



1. A coaxial connector comprising:

a dielectric member having a bore extending therethrough;

a center contact member for disposition in said bore and for connection with a center conductor of a coaxial cable;

inner shell means hving a first section in which said dielectric member is positioned and a ferrule section on which an outer conductor of the coaxial cable is to be crimped;

spring contact means including a tubular section and spring contact section means, said tubular section extending about said first section of said inner shell means, said spring contact section means including leaf spring contact means extending parallel relative to the axis of the connector and leaf spring means bent back along respective ones of said leaf spring contact means;

outer shell means having a first member engaging said tubular section and a second member extending along said spring contact section means, a front end of said second member defining an entrance to said spring contact section means;

means between said first member and said tubular section securing said first member and said tubular section together; and

crimping ferrule member means for crimping the outer conductor onto said ferrule section.

4,412,718

ELECTRIC PLUG CONTACT AND METHOD FOR ITS MANUFACTURE

Max Pfister, Hunenberg, Switzerland, assignor to CDM Connectors Development & Mfg. AG, Cham, Switzerland

Division of Ser. No. 189,845, Oct. 15, 1979, Pat. No. 4,341,434. This application Feb. 18, 1982, Ser. No. 349,862

Claims priority, application Switzerland, Feb. 17, 1978, 1746/78

Int. Cl.³ H01R *11/22, 43/00*

U.S. Cl. 339—256 R **5 Claims**

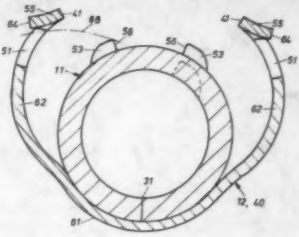
1. A method of fabricating an electric plug contact which comprises the steps of

(a) providing a prefabricated, elongated, electrically conductive contact body which has a cylindrical portion that includes at least one pair of anchoring members extending outwardly thereof,

(b) providing an elongated, flat sheet metal blank which includes generally parallel side edges and pairs of perforations therein at least equal in number to the number of pairs of anchoring members on the contact body, each perforation of each pair of perforations being located near an opposite side edge of the sheet metal blank so as to create a holding bridge portion between each perforation and an associated side edge, each perforation being suitably located and shaped to be engagable by a separate anchoring member,

(c) bending the elongated, flat sheet metal blank into a generally U-shaped configuration, the U-shaped configuration including a middle part and two lateral leg parts, the middle part and the two leg parts, when viewed in cross section, each extending along a circular arc which extends over about 120° and are adaptable to conform to the outer surface of the cylindrical portion of the contact body,

(d) placing the contact body between the leg parts of the generally U-shaped sheet metal blank and such that it



contacts the middle part, the contact body being oriented such that the anchoring members extending outwardly thereof are on the side opposite the side in contact with the middle part of the generally U-shaped sheet metal blank,

(e) bending the leg parts of the generally U-shaped sheet metal blank towards the outer surface of the cylindrical portion of the contact body until the side edges thereof are closely positioned and the perforations therein enclose the anchoring members of the contact body, each anchoring member contacting an associated holding bridge of the bent sheet of metal blank.

4,412,719

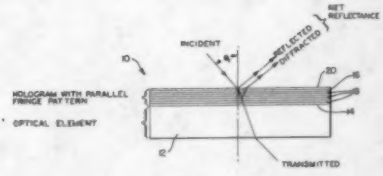
METHOD AND ARTICLE HAVING PREDETERMINED NET REFLECTANCE CHARACTERISTICS

James R. Fienup, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Apr. 10, 1981, Ser. No. 252,774

Int. Cl.³ G02B *5/32*

U.S. Cl. 350—3.7 **8 Claims**



1. An article having predetermined net reflectance characteristics, said article comprising:

an optical element having a major surface;

a holographic layer on the surface for reflecting light at a given amplitude and phase from the interface between the layer and the surrounding environment above the layer, said holographic layer having fringe patterns parallel with the surface, operative for diffracting light from the fringes at a predefined amplitude and phase with respect to the amplitude and phase of the reflected light;

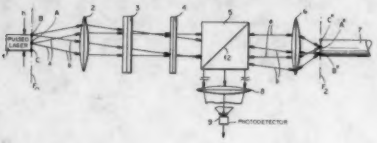
whereby the net reflection of light impinging on the article is determined by the amplitude and phase relationship between the reflected and diffracted light from the holographic layer.

4,412,720

OPTICAL SYSTEM COUPLING A RECTANGULAR LIGHT SOURCE TO A CIRCULAR LIGHT RECEIVER

Bruno Costa, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Apr. 21, 1981, Ser. No. 256,001
Claims priority, application Italy, Apr. 23, 1980, 67634 A/80
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.18 8 Claims



1. An optical system for illuminating a substantially circular area of a light receiver by light from a source of substantially rectangular outline,

comprising an anamorphotic lens assembly with a first focal plane at said source and with a second focal plane at said area, said lens assembly having a magnification ratio in a plane parallel to the minor sides of said outline exceeding its magnification ratio in a plane parallel to the major sides of said outline;

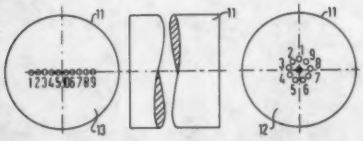
said lens assembly comprising positively refracting first spherical lens means focused upon said source, positively refracting second spherical lens means coaxial with said first spherical lens means focused upon said area, and an afocal pair of cylindrical lenses in a field of parallel light rays existing between said first and second spherical lens means.

4,412,721

TRANSITION PIECE FOR THE CONVERSION OF A CIRCULAR CONDUCTOR ARRANGEMENT OF A CABLE OR SUCH INTO A LINEAR CONDUCTOR ARRANGEMENT AND CONVERSELY

Kuno Saatze, Emmering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,415
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1980, 3026631
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 5 Claims



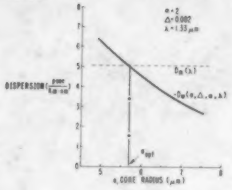
1. A guide-channel transition piece for conversion of a circular conductor arrangement of a multiconductor cable or such into a linear conductor arrangement and vice-versa, comprising: a formed part with spatially running hollow guide channel means continuously extending between two faces of the transition piece for freely receiving the individual conductors of the cable inserted into the channel means; on one face of the formed part channel inlets for the conductors are arranged in circular fashion corresponding to a structure of the cable, and at the other face channel outlets are arranged corresponding to a desired linear conductor arrangement.

4,412,722

SINGLE MODE FIBER WITH GRADED INDEX OF REFRACTION

Anthony Carnevale, Warren; Un-Chul Paek, West Windsor Township, Mercer County, and George E. Peterson, Warren, all of N.J., assignors to Western Electric, New York, N.Y. and Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 26, 1981, Ser. No. 315,020
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.31 9 Claims



1. An optical fiber comprising a core with a graded index of refraction given substantially by a profile exponent $\alpha \cong 2$ and a cladding,

the Δ index of refraction of the core, core radius, and profile exponent α of the core being such that

(a) the fiber supports essentially only one propagating mode in the wavelength range of 0.6–1.7 microns;

(b) the fiber has a total dispersion <5 psec/Km.nm in at least a part of the spectral region from 0.6–1.7 microns;

(c) the total dispersion associated with the fiber is the sum of at least a nonzero waveguide dispersion and a nonzero material dispersion; and

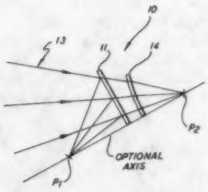
(d) the wavelength at which the total dispersion is minimized is different than the zero material dispersion wavelength.

4,412,723

OPTICAL SYSTEM FOR CORRECTING THE ABERRATIONS OF A BEAMSPLITTER IN CONVERGING LIGHT

David R. Shafer, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 28, 1981, Ser. No. 267,950
Int. Cl.³ G02B 27/10
U.S. Cl. 350—171 5 Claims



1. An optical system for providing substantially identical reflected and transmitted images carried in a beam of light, comprising in combination;

a beamsplitter disposed in the path of the beam of light providing a reflected and transmitted image,

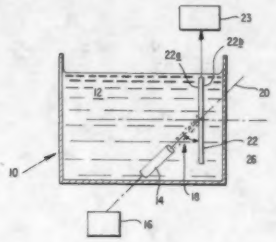
a lens disposed in the path of said beam of light transmitted through said beamsplitter, said lens bent toward said transmitted image and having front and back radii which terminate on a line connecting said reflected and transmitted images.

4,412,724

STRIATING LIQUID CRYSTAL DISPLAY SUBSTRATES WITH ULTRASONICALLY CAVITATING BUBBLE BEAMS

Jaswinder S. Sandhu, Chicago, Ill., assignor to RAJ Technology Partnership, Chicago, Ill.

Filed Mar. 30, 1981, Ser. No. 248,869
Int. Cl.³ G02F 1/13, 1/137
U.S. Cl. 350—341 5 Claims



1. A method of producing a liquid crystal display which exhibits a high contrast ratio and which includes a pair of substrate members and a liquid crystal film disposed therebetween, said method including treating the surface of the substrate intended to contact the liquid crystal film so as to form striations therein by:

(a) immersing said substrate in a liquid;

(b) ultrasonically cavitating the liquid so as to form a beam of cavitation bubbles;

(c) directing the beam toward the substrate so that bubbles in the beam strike the substrate surface; and

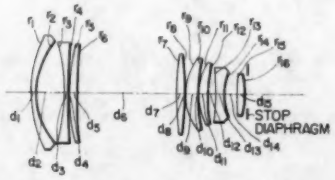
(d) moving said substrate in a direction at a predetermined speed so that the surface of the substrate is striated by the bubbles in the direction of movement.

4,412,725

REAR STOP DIAPHRAGM ZOOM LENS

Satoru Tachihara, and Sadao Okudaira, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,107
Claims priority, application Japan, Dec. 20, 1980, 55-181024
Int. Cl.³ G02B 9/64, 15/16
U.S. Cl. 350—426 4 Claims



1. A rear stop diaphragm type zoom lens composed, in order from the object side, of a first lens group as a whole having a negative refractive power and consisting of two negative lenses and a positive lens and a second lens group as a whole having a positive refractive power and consisting of three positive lenses, a negative lens and a positive lens, in which an aerial space between said lens groups is varied to thereby vary the magnification, and a stop diaphragm is disposed behind the overall lens system with the stop diaphragm being maintained at a constant position with respect to the focusing surface during variation of magnification, the zoom lens satisfying the following conditions:

$$0.6 \leqq f_T/|f_I| \leqq 0.9 \quad (1)$$

$$1.2 < Z_T \leqq 2.3 \quad (2)$$

$$0.6 \leqq f_{IIP}/f_{II} \leqq 0.75 \quad (3)$$

$$n_{LA} > 1.70 \quad (4)$$

$$R_{LN} < -2.5 f_{IIP},\ R_{LN} < 0 \quad (5)$$

where f_T is the focal length of the overall lens system at the telephoto end,

Z_T is the zoom ratio,

f_I is the resultant focal length of the first lens group,

f_{II} is the resultant focal length of the second lens group,

f_{IIP} is the resultant focal length of the positive lenses disposed in front of the negative lens in the second lens group,

n_{LA} is the refractive index of the positive lens disposed closest to the object in the second lens group, and

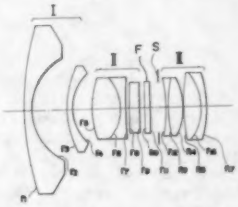
R_{LN} is the radius of curvature of the object-faced surface of the negative lens of the second lens group.

4,412,726

FISH EYE LENS SYSTEM

Mitsuaki Horimoto, Sennan, Japan, assignor to Minolta Camera Kabushiki Kaisha, Higashi, Japan

Filed Jan. 13, 1981, Ser. No. 224,791
Claims priority, application Japan, Jan. 17, 1980, 55-4406
Int. Cl.³ G02B 9/60, 9/62
U.S. Cl. 350—461 15 Claims



1. A fish eye lens system comprising:

a front lens group consisting of a pair of negative meniscus lens elements both convex to the object side;

an intermediate lens group consisting of a pair of positive lens elements and a negative lens element; and

a rear lens group consisting of a pair of doublets, the object side one of which includes an intermediate cemented surface having a positive refractive power.

4,412,727

OPTICAL SYSTEM FOR TILTABLE LENS BARREL OF A MICROSCOPE

Akio Taira, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Apr. 24, 1981, Ser. No. 257,007
Claims priority, application Japan, Jul. 15, 1980, 55-96386
Int. Cl.³ G02B 21/20
U.S. Cl. 350—514 12 Claims

1. An optical system for a tiltable lens barrel of a microscope, comprising:

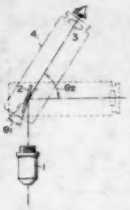
objective lens means, having a first optical axis, for projecting an optical image along said first optical axis;

first reflecting means disposed on said first optical axis and comprising a reflecting mirror for directing said optical image along a second optical axis different than said first optical axis;

second reflecting means disposed on said second optical axis for directing said optical image along a third optical axis different than said second optical axis;

third reflecting means disposed on said third optical xis for directing said optical image along a fourth optical axis different than said third optical axis;

a tiltable lens barrel which houses both said third reflecting means and an eyepiece system located on said fourth optical axis and permitting viewing of said optical image, said tiltable lens barrel being rotatable together with said third



reflecting means around said third optical axis so as to change an axial tilt angle of said tiltable lens barrel; and

an image rotator which is disposed along one of said axes between said objective lens means and said tiltable lens barrel in order to maintain said optical image as viewed through said eyepiece system at a predetermined orientation irrespective of changes in said axial tilt angle; said image rotator includes a trapezoidal prism which rotates through an angle of rotation which is half the angle of rotation of said tiltable lens barrel around an optical axis of light incident thereupon.

4,412,728

FOCUSING APPARATUS FOR EYE-FUNDUS EXAMINING INSTRUMENT

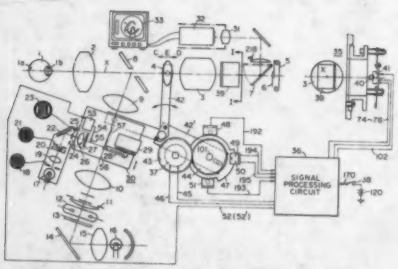
Toshio Sakane; Haruhisa Madate, and Yoshimi Kohayakawa, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1980, Ser. No. 180,103

Claims priority, application Japan, Aug. 24, 1979, 54-107729

Int. Cl.³ A61B *3/14;* G03B *29/00*

U.S. Cl. 351—206 **20 Claims**



1. An eye-fundus examining instrument comprising:

an optical system for examining the fundus of an eye, said optical system having movable means movable for focusing;

an illumination system for illuminating the fundus of the eye;

a mark projecting system for projecting a focus mark upon the fundus of the eye that can be focused on the fundus of the eye;

a light-receiving system provided with a photosensor array for detecting the position of the focus mark image reflected by the fundus of the eye, the detected position of the focus mark image indicating the condition of focus of the focus mark on the fundus of the eye;

observation means, coupled to said optical system, for observing therethrough the image of the fundus of the eye and the focus mark image;

focusing means for simultaneously focusing said optical system, said mark projecting system and said light-receiving system relative to the fundus of the eye;

manual control means for manually controlling said focusing means;

drive means for driving said focusing means; and

a circuit electrically coupled to said photosensor array for controlling said drive means.

4,412,729

VISION TESTING DEVICE

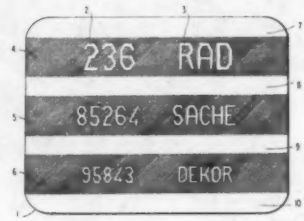
Erwin Hartmann, Munich, Fed. Rep. of Germany, assignor to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Filed Nov. 17, 1980, Ser. No. 207,801

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946325

Int. Cl.³ A61B *3/00*

U.S. Cl. 351—239 **12 Claims**



1. A test field for an apparatus for testing the vision of a person as regards ability to work on video display terminals, in which indicia of different sizes and recognizability are presented to the person to be tested, characterized in that the indicia appear in a darker surrounding field, and in that brighter areas having a luminance of between 250–1000 cd/m^2 are provided adjacent the surrounding field, the luminance of the darker surrounding field being about one-fifth to one-eighth of the luminance of the indicia while the luminance of the indicia is about one-fifth to one-tenth of the luminance of the brighter areas.

4,412,730

METERING DEVICE

Takashi Saegusa, Sagamihara, and Toru Fukuhara, Isehara, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 295,003

Claims priority, application Japan, Aug. 28, 1980, 55-118920; Aug. 28, 1980, 55-118921

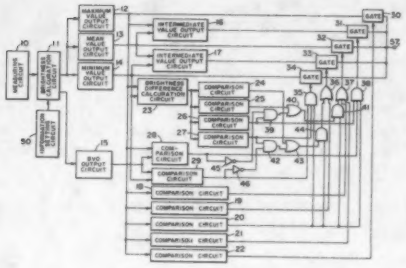
Int. Cl.³ G03B *7/08, 7/28;* G01J *1/44*

U.S. Cl. 354—31 **9 Claims**

1. A metering device for metering an object field by dividing it into a plurality of areas and a plurality of photosensitive means producing a plurality of metering outputs corresponding to the brightness of individual areas of said object field, said device including:

(a) means for extracting from said plurality of metering outputs a plurality of reference outputs different in level from one another, said extracting means including a circuit for calculating a maximum value output corresponding to the maximum brightness value of the brightness of said areas, a circuit for calculating a minimum value out-

put corresponding to the minimum brightness value of the brightnesses of said areas, a circuit for calculating a mean value output corresponding to the mean brightness value of the brightnesses of said areas, a circuit for calculating a first intermediate value output corresponding to the intermediate value of said maximum brightness value and said mean brightness value, and a circuit for calculating a



second intermediate value output corresponding to the intermediate value of said minimum brightness value and said mean brightness value;

(b) means for evaluating the level of at least one of said reference outputs; and

(c) means responsive to said evaulating means to select and put out one of said reference outputs.

4,412,731

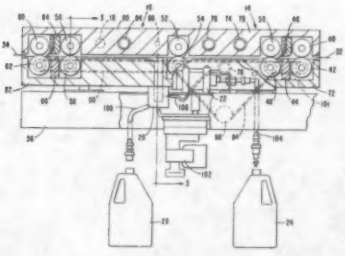
HIGH SPEED LOW TEMPERATURE DIAZO PROCESSOR

Peter E. Herborn, Menlo Park; Thomas T. Liu, Sunnyvale, and Sze-Teh Young, San Jose, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 29, 1981, Ser. No. 287,973

Int. Cl.³ G03D *7/00*

U.S. Cl. 354—299 **3 Claims**



1. A diazo film developing system comprising a

first chamber made of aluminum and having a heater for preheating said film, a

second chamber made of aluminum and positioned for developing said preheated film,

means for heating said second chamber and maintaining a desired operating temperature therein,

means for moving said film through said first and said second chambers, and a

third chamber directly connected with said second chamber for receiving aqueous ammonia in controlled manner, said third chamber comprising an elongated trough contiguous with and opening into said second chamber and disposed at one end thereof and being entirely of stainless steel material having a lower heat-conducting property than the aluminum material of said second chamber for maintaining a temperature differential therebetween, said elongated trough having a temperature lower than the temperature of said second chamber whereby said aqueous ammonia is vaporized and the ammonia vapor rises from the elongated trough and contacts the emulsion of said film moving through the second chamber, the temperature differential causing the ammonia to separate from the water prior to contact with said film.

4,412,732

TRANSFER MEDIUM SEPARATING DEVICE

Yoshihiro Ogata, Yokohama; Yoshihiro Abe, Tokyo, and Harumi Takahashi, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 17, 1981, Ser. No. 284,343

Claims priority, application Japan, Jul. 21, 1980, 55-98700; Jul. 21, 1980, 55-98701

Int. Cl.³ G03G *15/00, 15/14*

U.S. Cl. 355—3 TR **11 Claims**

1. A transfer medium separating device for separating a transfer medium from a first carrier means, bearing thereon a toner image, to which said transfer medium has been brought into contact to transfer the toner image onto said transfer medium from said first carrier means, comprising:

second carrier means of an electrically conductive material to which said transfer medium having thereon said toner image is to be gradually brought into contact due to electrostatic forces from its leading edge as separated from said first carrier means;

potential application means for selectively applying at least a first level potential and a second level potential which is different from said first level potential to said second carrier means;

timing control means for controlling the timing of changing from said first level potential to said second level potential to be applied to said second carrier means such that said second carrier means is kept at said first level potential until the leading edge of said transfer medium has reached a predetermined reference point along its traveling path with respect to said second carrier means; and

timing adjusting means connected to said timing control means for adjusting the timing of changing potentials by said timing control means and thus adjusting the location of said reference point in response to conditions of the separating operation.

4,412,733

BELT DEVELOPING APPARATUS

George J. Doutney, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 2, 1981, Ser. No. 298,714

Int. Cl.³ G03G *15/08, 15/09*

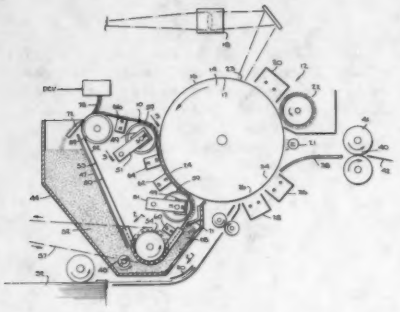
U.S. Cl. 355—3 DD **7 Claims**

1. A dry magnetic developing apparatus for use in an electrophotographic copier having a moving photoconductor on which an image is developed, said apparatus comprising:

a. means for holding a supply of dry magnetic developing material;

b. an endless web formed of flexible material and having a textured surface which is capable of carrying said developing material therewith;

c. guide means for guiding said web through said supply of developing material and to and from the moving photoconductor; and



d. magnetic means fixedly mounted in juxtaposition to a surface of the photoconductor and intermediate said guide means and defining a gap between said magnetic means and said surface of the photoconductor through which said web passes, said gap defining an extended developing zone in which said magnetic means causes the developing material carried by said web to be tumbled thereon as said web passes through said extended developing zone for the purpose of developing a charged image on said surface of the photoconductor.

4,412,734

ELECTROPHOTOGRAPHIC COPIER WITH COPY PAPER SUPPLY DEVICE

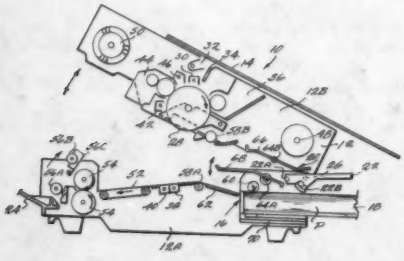
Kunihiro Shibuya, and Yasuhiro Iwata, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 1, 1981, Ser. No. 307,579

Claims priority, application Japan, Oct. 30, 1980, 55-153295[U]

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 SH **10 Claims**



1. An electrophotographic copier comprising:

a housing including a first frame and a second frame pivotally connected on the housing;

a first paper supplying means for supplying copy paper within said housing and having a first paper guide plate mounted on said first frame;

a second paper supplying means for supplying copy paper within said housing and having a second paper guide plate mounted on said second frame;

a third paper guide plate pivotally mounted on the housing, said third paper guide plate defining a first paper feed guide path with said first paper guide plate and a second paper feed guide path with said second paper guide plate;

said first paper supplying means including said first paper feed guide path and said second paper supplying means including said second paper feed guide path; and

means for receiving paper from either of said first and second paper supplying means and producing an image of an original thereon.

4,412,735

IMAGE FORMATION APPARATUS

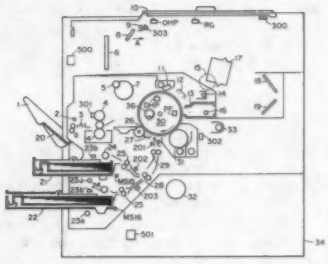
Masaharu Tsukata, Kawasaki, and Koichi Murakami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,359

Claims priority, application Japan, Apr. 26, 1980, 55-56081; Oct. 31, 1980, 55-154457

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **45 Claims**



1. A copying apparatus comprising:

copying process means for forming an image on a copy medium;

means for presetting the number of times for which copying is to be repeated;

delay means for inhibiting the starting of copying after closing of a main switch;

means for instructing to start copying;

sequence control means for starting the copying in response to said start means after the delay of said delay means has been released and for rendering said process means ready for the next cycle of copying after the repeated copying by said preset means has been terminated;

means for providing an accoustic warning of a malfunction in said apparatus or of the delay of said copying; and

means for controlling the tone quality or sound volume of said warning means in accordance with the sequence of said sequence control means.

4,412,736

COLLECTION OF SUSPENDED TONER PARTICLES

Koji Sakamoto, Tokyo, and Misao Tanzawa, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 22, 1981, Ser. No. 286,041

Claims priority, application Japan, Jul. 24, 1980, 55-101633; Jul. 24, 1980, 55-104869[U]

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **13 Claims**

1. Apparatus for collecting suspended, charged particles comprising:

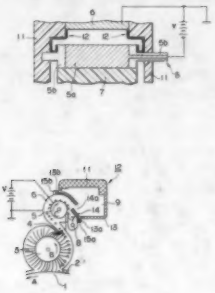
a support member;

a roller electrode rotatably supported by said support member and including an electrically insulating section pro-

vided at least at a part of the peripheral surface of said roller electrode;

a counter electrode disposed opposite to the peripheral surface of said roller electrode;

a blade provided in contact with the peripheral surface of said roller electrode, said blade being also in contact with



at least a part of said insulating section thereby preventing said roller and counter electrodes from being bridged through the particles deposited on said support member; and

a high voltage source connected between said roller electrode and said counter electrode.

4,412,737

POSITION DETECTING DEVICE FOR A ZOOM LENS OF A COPYING MACHINE

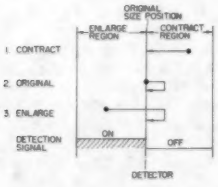
Hisao Iwanade, and Ikuo Negoro, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 358,948

Claims priority, application Japan, Mar. 19, 1981, 55-38645[U]

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—55 **8 Claims**



1. A magnification varying device for a copying machine, comprising a zoom lens having lens groups held by holding members, a numerically-controlled motor for moving said zoom lens to obtain a desired magnification, and a lens position detecting device, said position detecting device including a detecting piece provided on one of said holding members;

a detector for detecting the presence of said detecting piece; said detector detecting a position of said zoom lens when a power switch of said copying machine is turned on; and

circuit means which, according to a detection signal outputted by said detector, drives said numerically-controlled motor to return said zoom lens to a life-size magnification position.

4,412,738

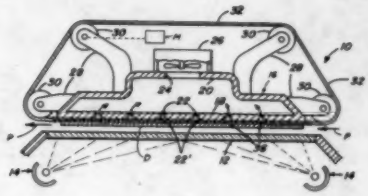
VACUUM DOCUMENT FEEDER

Douglas K. Ahern, Penfield, and Edwin E. Cleaveland, III, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 142,534, Apr. 21, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,685

Int. Cl.³ G03B *27/64*

U.S. Cl. 355—76 **5 Claims**



5. In a feeder for transporting a document page in juxtaposition to an illumination platen of a reproduction apparatus where such document page is illuminated to form a reflected light image thereof, said feeder including a vacuum plenum having a reflective wall defining a plurality of spaced ports overlying the illumination plate, the improvement comprising:

a document page transport belt movable along said plenum wall in a direction to feed a document page to the platen, said belt having a reflective surface for contacting such document page and defining means, spaced from the wall ports, providing fluidic passage between said reflective surface and the opposite surface of said belt; and light reflective means operatively associated with said plenum wall and belt for fluidically interconnecting the wall ports and said passage defining means so that vacuum within the plenum is effective to tack a document page to said belt for movement therewith to the illumination platen, and light trapping by such reflective means during illumination is prevented.

4,412,739

HINGED GLASS PHOTOMASK ASSEMBLY

James M. Freiberg, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 13, 1981, Ser. No. 224,782

Int. Cl.³ G03B *27/04*

U.S. Cl. 355—89 **6 Claims**

1. An article of manufacture for use in photolithograhic processes which comprises:

a. two glass sheets;

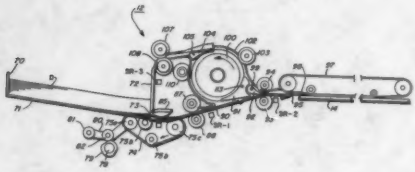
b. at least one photomask image; and

c. a flexible polymeric hinge, wherein said polymeric hinge is directly bonded to both glass sheets.

4,412,740
VERY HIGH SPEED DUPLICATOR WITH DOCUMENT HANDLING

Gerald A. Buddendeck, Penfield, and Karl M. Kau, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1981, Ser. No. 314,633
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **8 Claims**



1. In a reproduction machine having a document handling apparatus for feeding document sheets individually from a stack to an exposure platen for the machine and return to the stack for selective repeated copying of one side only or both sides of the document sheets, the improvement comprising:

a document support member adjacent to one side of the platen for supporting the stack, said support member having means associated therewith for feeding each document sheet from the bottom of the stack,

means defining a sheet path from the document sheet feed means to the platen without inverting the sheet,

means defining a sheet path from the platen including a loop for inverting the sheet and to return the sheet to the platen in an inverted orientation,

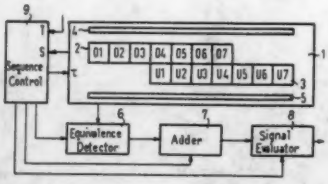
deflector means in said loop and being movable to an operative position for directing the document sheet back to the platen in the inverted orientation or movable to another operative position to return the sheet to the top of the stack in its original orientation, and

control means for selectively actuating said deflector means to either of said operative positions.

4,412,741
METHOD FOR THE AUTOMATIC OR SEMIAUTOMATIC DISTANCE MEASUREMENT AND FOCUSING OF THE IMAGE OF AN OBJECT ONTO A FOCAL PLANE

Karl-Ulrich Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 69,788, Aug. 27, 1979, Pat. No. 4,320,302. This application Aug. 24, 1981, Ser. No. 295,256
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838647
Int. Cl.³ H01J *40/14*; G03B *7/08*; G01C *3/00, 5/00*
U.S. Cl. 356—1 **14 Claims**



1. In a method for automatic distance measurement including the steps of

(a) examining two line shaped image sections so as to locate respective linear image segments thereof which have a maximum correlation as to respective corresponding light intensities along the lengths of the respective image segments,

(b) conducting a correlation examination by comparing different image segments of the two line shaped image sections in a predetermined order as a sequence of comparison steps, such that the identification of the comparison step giving rise to a maximum correlation provides a measure of distance, and

(c) utilizing the identification of the comparison step giving rise to the maximum correlation to provide an automatic distance indication,

the improvement wherein

(d) the examining of the two line shaped image sections pursuant to step (a) above is effected by storing image element signals in successive stages of first and second shift registers in accordance with the light intensities of successive elemental regions of the respective line shaped image sections, and

(e) the conducting of the correlation examination pursuant to step (b) above is effected by

(e1) during each comparison step, reading out in parallel at one respective end of each shift register from a number of shift register stages corresponding to the number of elemental regions which represent the length of an image segment,

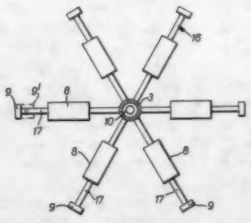
(e2) comprising corresponding image element signals of the respective subsets of image element signals read out from the respective shift registers during the comparison step, so as to compare the corresponding segments of the respective line shaped image sections, and

(e3) after each reading out of respective subsets of image element signals at the respective one ends of the respective shift registers, alternately shifting the image element signals of the first shift register toward its one end and again executing a comparison step, and alternately shifting the image element signals of the second shift register toward its one end and again executing a comparison step, so that subsets of image element signals corresponding to segments of the two image sections are respectively supplied for comparison with each other in a predetermined order and during a sequence of comparison steps defined by the alternate shifting of the image element signals in the first and second shift registers.

4,412,742
APPARATUS FOR USE IN INVESTIGATING SPECIMENS

Peter H. Lloyd, Birmingham, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 710,556, Aug. 2, 1976, abandoned. This application Nov. 21, 1978, Ser. No. 963,938
Claims priority, application United Kingdom, Aug. 8, 1975, 33250/75
Int. Cl.³ G01N *21/01, 21/13*
U.S. Cl. 356—73 **51 Claims**



1. Apparatus for monitoring chemical reactions occurring in

a plurality of liquid or like sample substances carried in a plurality of respective cuvettes whose walls are at least to some extent capable of transmitting radiant energy which comprises:

support means,

a rotor mounted on said support means for rotation thereon on an axis,

a turntable mounted coaxially with the rotor for rotation relative to said support means, and for holding a plurality of said radiant-energy-transmissive cuvettes in a circular arrangement coaxially with said axis,

first drive means for rotating the turntable on its axis in a first program of rotation whereby the cuvettes describe an annular path as the turntable rotates.

second drive means for rotating the rotor on said axis in a second program of rotation in which the number of total revolutions of the rotor for a given period of time is greater than the number of revolutions of the turntable for the same period of time, and

photometer means including radiant energy source means fixedly mounted on the rotor for rotation therewith and defining at least one beam path for radiant energy from said source means which extends at least through said annular path such that the beam path includes and traverses at least a portion of the sample substance which may be contained in any of said cuvettes which intersects such beam path during rotation of the turntable,

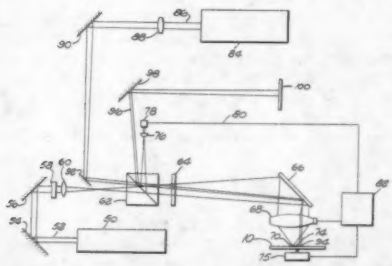
said photometer means including electrical signal production means fixed on the rotor to rotate therewith for responding to any radiant energy projected along said beam path to produce electrical signals as cuvettes intersect said beam path.

4,412,743

OFF-AXIS LIGHT BEAM DEFECT DETECTOR

Carlyle J. Eberly, Long Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Sep. 8, 1981, Ser. No. 300,364
Int. Cl.³ G01N *21/88*
U.S. Cl. 356—237 **17 Claims**



1. A beam scanning apparatus for detecting a property of a light beam reflected from a surface to be scanned, comprising:

(a) a focusing lens disposed a distance from said surface and having its central axis perpendicular to said surface;

(b) means for maintaining a predetermined substantially fixed distance between said focusing lens and said surface;

(c) scanning means for providing lateral movement between said lens and said surface;

(d) first light beam means for providing a first light beam disposed in a nonparallel relationship with the central axis of said lens, said light beam being directed to pass through said lens to said surface, the axis of said first light beam passing through the focal point of said lens located on the opposite side of said lens from said surface; and

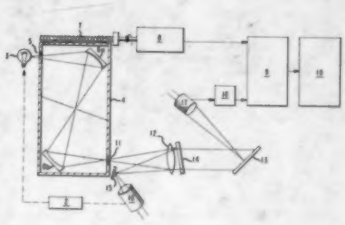
(e) light beam sensing means for detecting a spatial property of that portion of said light beam reflected off of said surface and transmitted back through said lens.

4,412,744

ABSOLUTE SPECTROPHOTOMETER

Jerald D. Lee, Mendenhall, Pa., and Charles D. Reilly, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 1, 1981, Ser. No. 268,707
Int. Cl.³ G01J *3/42*
U.S. Cl. 356—319 **10 Claims**



1. In a spectrophotometer having a light source, a scanning type monochromator having an entrance slit and an exit slit for a light beam from the light source and containing a light dispersing or selection element and a wavelength drive mechanism to provide light beams of different wavelengths over a light spectrum constantly being scanned, beam-shaping optics at the exit slit of said monochromator and an object photometer for measuring the intensity of reflected or transmitted light from an object being tested and generating an electrical signal proportional to the intensity of the light measured and electrically connected to means for recording said electrical signal as a function of wavelength measured, the improvement used therewith comprising:

(a) a beam splitter, positioned between said beam-shaping optics and said object, for dividing the beam exiting from the monochromator into first and second light beams, whereby the first beam is incident upon the object;

(b) a reference photometer measuring the flux of the second light beam and generating an output electrical signal proportional to the intensity of the light measured; and

(c) a light source control, connecting said reference photometer with said light source, which receives the electrical signal from the reference photometer and generates a feedback electrical signal to adjust the intensity of the light source by means of a proportional/integral controller to maintain the reference photometer output electrical signal level constant across the light spectrum being scanned.

4,412,745

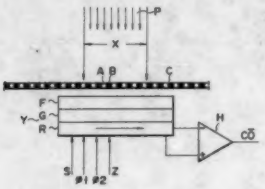
APPARATUS FOR MEASURING LENGTH OR ANGLE

Fumio Ohtomo, Kawagoe, and Kazuaki Kimura, Tokyo, both of Japan, assignors to Tokyo Kogaku Kikai K. K., Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,789
Claims priority, application Japan, May 12, 1980, 55-62407
Int. Cl.³ B01B *11/14*
U.S. Cl. 356—373 **9 Claims**

1. An apparatus for measuring length or angle comprising a scale containing length or angle information recorded in the form of a bright and dark bit pattern, illuminating means for illuminating said scale with light in the form of a pulse to let said information to be sent out from said scale, a storage effect type sensor including a photoelement section having a plurality of light receiving elements for converting the information sent out from said scale into electric charge and storing said electric charge and a register section provided to correspond to said photoelement section for simultaneously memorizing the charge stored in the individual light receiving elements in said photoelement section, sensor drive means for effecting the control of transfer of charge from said photoelement section to said register section and data read-out scanning for reading out

data from said register section, said sensor drive means also serving to effect at least one "full emptying scanning", i.e., "emptying scanning" of at least all the bits of said register section, at a scanning frequency higher than the frequency for the data read-out scanning prior to the start of the data read-



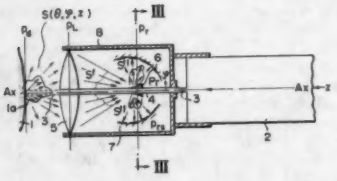
out scanning, means for subtracting the read-out data when said scale is not being illuminated by said illuminating means from the read-out data when said scale is being illuminated, and means for processing the data obtained from said subtracting means and outputting the data obtained through the processing.

4,412,746

OPTICAL NONCONTACTING DETECTOR

Hirotaka Yokouchi, Muroran, Japan, assignor to The President of Muroran Institute for Technology, Hokkaido, Japan

Filed Mar. 4, 1981, Ser. No. 240,575
Claims priority, application Japan, Jul. 16, 1980, 55-97375
Int. Cl.³ G01N *21/47*; G02B *5/14*
U.S. Cl. 356—446 **11 Claims**



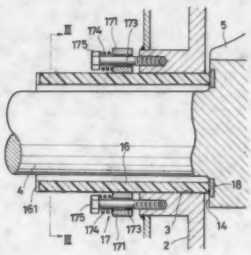
1. In an optical noncontacting detector for detecting the roughness of a surface such as ridges and grooves thereon comprising, a light-projecting system for radiating a beam of light on a surface the roughness of which is to be detected and having a tubular barrel having an open front end through which said beam of light is emitted, an elongated light-transmitting means coaxial with the tubular barrel for transmitting the beam of light out of the open end of the tubular barrel without dispersion of light internally of the tubular barrel, a source of light emitting and transmitting said beam of light through said light-transmitting means, a light-receiving system having light-gathering means on said tubular barrel for gathering into the tubular barrel light rays reflected from said surface when said beam of light radiates said surface and having means for converging reflected light rays at an area of reference internally of said tubular barrel, and said light-receiving system comprising reflected-light transmitting means disposed in said tubular barrel outside of said light-transmitting member and shielded therefrom and symmetrically about the longitudinal axis of said tubular barrel for receiving the reflected light rays and converting them into a selected distribution for eventual transducing thereof.

4,412,747

SEALING DEVICE IN MIXING EQUIPMENT

Masao Moriyama, No. 508-13, Tendocho 17, Nishinomiyashi, Hyogo, Japan

Filed Feb. 8, 1982, Ser. No. 346,594
Claims priority, application Japan, Feb. 6, 1981, 56-17291
Int. Cl.³ B29B *1/06*
U.S. Cl. 366—99 **7 Claims**



1. In mixing equipment for mixing viscous liquids, including a bowl having side walls, a mixing blade carried on a rotating shaft extending through a bore in said side walls of said bowl and supported on bearings located outside bowl, and a sealing device preventing the mixing liquid from leaking from where the rotating shaft emerges from the bowl, said sealing device comprising:

a cylindrical packing surrounding said emerging portion of said rotating shaft and extending through said bore in said bowl, said cylindrical packing being supported on said side walls of said bowl with a clearance interposed therebetween and such that an inside surface of said packing is exposed to air, said packing further being made of plastic;

said mixing blade including a shoulder at each end portion from which said rotating shaft thrusts into the side wall of said bowl to emerge therefrom;

said shoulder having an engaging face for engagement with the end face of said cylindrical packing;

said cylindrical packing being extended sufficiently to cover said emerging portion of said rotating shaft;

means for pressing said cylindrical packing against said engaging face; and

said pressing means being adjustably fixed to said side wall of said bowl.

4,412,748

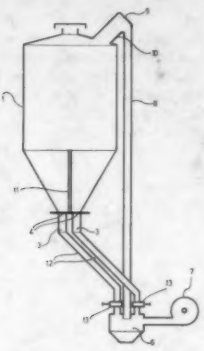
GRAVITY CIRCULATION MIXER

Norbert Wohnhas, and Wolfgang Siegel, both of Ravensburg, Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jul. 24, 1981, Ser. No. 286,544
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029393
Int. Cl.³ B01F *5/10, 5/24*
U.S. Cl. 366—341 **6 Claims**

1. A gravity circulation mixer for bulk goods including a mixing container having an upper part and a conical bottom, at least two discharge openings for separating the flow of the bulk goods into two quantity flows, a mixing bowl connected to these openings, the mixing bowl being provided with an opening for supplying feeding air and an ascending pipe connecting the bowl to the upper part of the mixing container, characterized in that the ascending pipe (8) is disposed externally of the mixing container (1) in a vertical position and is connected to a first gravity pipe (10) which extends downwardly into the upper part of the mixing container, that the mixing bowl (6) is laterally offset with respect to the center axis

of the mixing container so as to be coaxially disposed in the ascending pipe (8), and that at least a second gravity pipe (5, 12) is provided which extends obliquely to the ascending pipe and connects the discharge openings (4) with the mixing bowl.



4,412,749

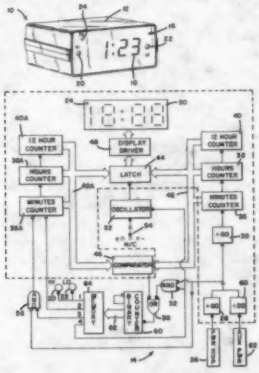
PROGRAMMABLE ELECTRONIC TIME AND TIDE CLOCK

Thomas A. Showalter, Middletown, Pa., assignor to Spectrum Design Co., Oberlin, Pa.

Filed May 3, 1982, Ser. No. 374,404

Int. Cl.³ G04B *19/26*

U.S. Cl. 368—19 **10 Claims**



1. A programmable electronic time and tide timing device, comprising:

pulse generating means for generating timing pulses;

first counter means for receiving said timing pulses and generating real time signals;

latch means and comparator means for receiving said real time signals;

oscillator means connected to said latch means for operating said latch means for a specified time;

memory circuit means and gate means receiving said timing pulses;

said memory circuit means adapted to generate tide time signals which are transmitted to said gate means;

second counter means receiving said tide time signals from said gate means and generating tide change signals which are transmitted to said latch means and said comparator means;

said comparator means triggering operation of said memory circuit means when said real time signals and said tide change signals are in coincidence thereby causing said memory circuit means to generate said tide change signals;

and display means connected to latch means for displaying alternately real time and the time when the next high or low tide is to occur.

4,412,750

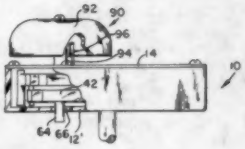
TIMING MECHANISM WITH TWO SEPARATE PROGRAMS OPERATING SEPARATE SWITCH ACTUATORS AND HAVING AN ALARM SYSTEM

Maurice E. Schuder, Indianapolis, and Richard W. Stafford, Clayton, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Division of Ser. No. 947,594, Oct. 2, 1978, Pat. No. 4,242,746. This application Sep. 15, 1980, Ser. No. 187,410

Int. Cl.³ G04F *8/00*; H01H *43/10*

U.S. Cl. 368—98 **6 Claims**



1. A timing mechanism comprising:

(a) power drive means,

(b) cam means coupled to said power drive means to be driven thereby, said cam means including a sharp drop contour;

(c) actuator means engaging said cam means to quickly drop at said sharp drop contour, and stop means quickly limiting said drop;

(d) alarm means;

(e) a spring biased striker pivotly carried on said actuator means and engaging said alarm means; whereby said striker drops with said actuator means and continues dropping after said actuator means engages said stop means to strike said alarm means.

4,412,751

JOINTED ELECTRONIC WATCH

Pierre Jeannet, Chambrelien; Raymond Froidevaux, Bienne, and Claude-Andre Gygax, Evilard, all of Switzerland, assignors to Omega SA, Bienne, Switzerland

Filed Aug. 23, 1982, Ser. No. 410,760

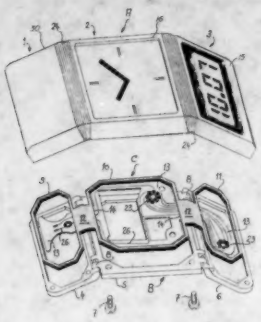
Claims priority, application Switzerland, Aug. 25, 1981, 5463/81

Int. Cl.³ G04C *03/00*; G04B *37/12, 23/12*

U.S. Cl. 368—276 **8 Claims**

1. A jointed electronic watch comprising at least two watch-cases coupled together by an articulation, each of said cases comprising a back cover, a case-band and a seal located between the back cover and the case-band wherein the seals are coupled together at the line of articulation by an isthmus formed of the same material as the seals and being integrated

therewith so as to form a moisture and dust blocking seal in one piece, electrical conductors being located within the isthmus



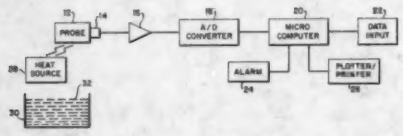
thereby to assure a sealed passage for electric connections between the watch-cases.

4,412,752

METHOD AND APPARATUS FOR DETERMINING THE COOLING CHARACTERISTICS OF A QUENCHING MEDIUM

Raymond A. Cellitti, Hinsdale, and John J. Connelly, Naperville, both of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Sep. 21, 1981, Ser. No. 303,812
Int. Cl.³ G01N *25/00*
U.S. Cl. 374—43 **1 Claim**



1. A method for determining an appropriate quenching medium for producing predetermined characteristics in a production part comprising the steps of:

determining the desired characteristics of the production part;

defining on a temperature transformation diagram the cooling characteristic required to obtain said desired characteristic;

immersing a heat test probe into a quenching medium and measuring the time versus temperature characteristic of the test probe, where said test probe has the same shape and same thermal conductivity as said production part; and

adjusting the characteristic of the quenching medium until the desired time versus temperature characteristic is obtained.

4,412,753

QUICK-OPENING BEARING BLOCK

James F. Linn, P.O. Box 511, Tallmadge, Ohio 44278

Filed Sep. 3, 1981, Ser. No. 299,084
Int. Cl.³ F16C *35/02*
U.S. Cl. 384—437 **5 Claims**

1. A quick-opening bearing block comprising:

(a) an elongated block base comprising:

(1) a lower bearing cup at one end;

(2) a lower center half-hinge section at the other end, spaced apart from said cup;

(3) an upwardly-extending post between said cup and said half-hinge;

(4) a lower semicylindrical bearing of fixed cylindrical circumferential length in said lower bearing cup for receiving a cylindrical shaft therein including means for mounting said bearing in said cup; and,

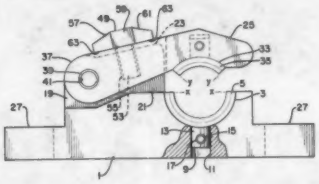
(5) a mount at each end of said base, including a slot therein, for receipt of a pin or bolt to fasten said base to a supporting surface;

(b) an elongated block cover comprising:

(1) an upper bearing cup at one end, adapted to mate with said lower bearing cup;

(2) a spaced apart pair of upper half-hinge sections at the other end thereof, adapted to receive said central lower half-hinge section therebetween and including a pin to connect said half-hinge sections together;

(3) a slot extending, from said spaced apart pair of upper half-hinge sections, toward said bearing cup to permit receipt of said post therethrough; and,



(4) an upper semicylindrical bearing of shorter cylindrical circumferential length in said bearing cup, to accommodate shafts of varying diameter and to compensate for bearing wear, including means for mounting said bearing in said cup;

(c) a T-shaped fastener having a lower portion, threadably received into said post, and an upper portion containing narrow, elongated opposing sides adapted to allow said fastener to pass freely through said slot in said block cover when aligned therewith as said cover is opened and closed comprising:

(1) a slanted upper surface to permit said cover to swing unopposed from full extended open position to full closed position on top of said base; and,

(2) a pair of lower locking surfaces to abut the top of said cover, as said fastener is twisted inward toward said base, to close and hold said block cover tightly down on said base when a cylindrical shaft is to be carried between said bearings.

4,412,754

SPACE BAR FOR LOW PROFILE KEYBOARDS

Daniel R. Sparks, Temple City, Calif., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Sep. 23, 1982, Ser. No. 421,742
Int. Cl.³ B41J *5/08*
U.S. Cl. 400—496 **7 Claims**

1. Space bar module apparatus for insertion into a low profile keyboard, characterized by

(a) an elongated base support having a central opening;

(b) an annular guide body positioned adjacent each end of said base support;

(c) a plunger body positioned over each said guide body;

(d) a plunger on each said support body vertically reciprocable in its respective guide body;

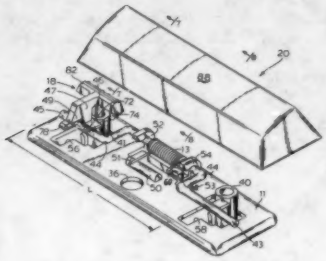
(e) leveling wire means extending between said plunger bodies for moving said plunger bodies in said guide bodies;

(f) cooperating stop means on said base support and each said plunger bar means for limiting the upward movement of said plunger bodies relative to said base support;

(g) resilient means extending between said leveling wire means and said base support for urging said leveling wire

means upwardly for continuously engaging said cooperating stop means; and

(h) an elongated key top extending between said plunger bodies for moving said plunger bodies downwardly against said resilient means;



(i) an integral elongated switch activation stem extending downwardly from said key top through said central opening for engaging a movable capacitive plate.

4,412,755

TYPEWRITER WITH AN ERASING APPARATUS

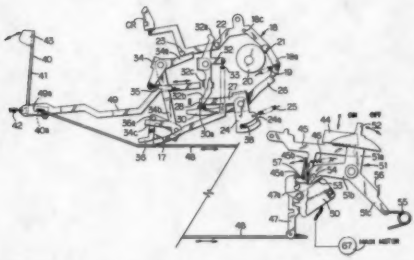
Hisao Kurachi; Takeo Itoh, and Hiroshi Onoda, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 21, 1981, Ser. No. 332,857

Claims priority, application Japan, Dec. 29, 1980, 55-187434

Int. Cl.³ B41J *29/16*

U.S. Cl. 400—697.1 **20 Claims**



1. A typewriter driven by an electric motor and provided with an erasing apparatus comprising:

means for printing selected characters;

erasing means for supporting an erase ribbon to move the same from an original position to a printing position in response to printing operation of said printing means;

a retaining member disposed movably between a first position and a second position, and normally positioned at the first position to retain said erasing means in a non-operative status;

manual operating means for moving said retaining member to the second position to preset said erasing means in an operative status wherein the erasing means is operable in response to the printing operation of said printing means;

means for locking said retaining member at the second position, said retaining member held at the second position by said locking means being returned to the first position in response to the printing operation of said printing means;

a manual switch member movable between an ON position and an OFF position for controlling the power supply to said electric motor; and

means for returning said retaining member held at the second position by said locking means to the first position in response to movement of said manual switch member from said ON position to said OFF position.

4,412,756

STRUCTURAL ELEMENT

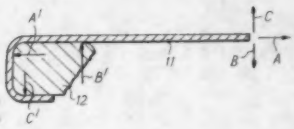
Edward H. Dunwoodie, Crowthorne, and Ronald W. Elston, Burnham, both of England, assignors to Transequip Limited, Middlesex, Great Britain

Filed Nov. 13, 1980, Ser. No. 206,550

Claims priority, application United Kingdom, Nov. 22, 1979, 7940377; Jan. 24, 1980, 8002437

Int. Cl.³ B25G *3/02*; F16D *1/00*

U.S. Cl. 403—363 **4 Claims**



1. An article comprising two sheets and a structural element, wherein each of said sheets has an elongate portion along which it is joined to said element, that portion being shaped to have an elongate, substantially trough-shaped part substantially as long as said portion, and the structural element has for the trough-shaped part of each said sheet a respective complementarily shaped profiled part substantially as long as, and interengaged with, the trough-shaped part of the associated sheet, an intermediate portion interconnecting the profiled parts, the intermediate portion being provided with a plurality of holes, the joint including removable clamping means which, when the interengaged parts are subjected to forces acting substantially transversely thereto, take up components of said forces which act in a direction tending to disengage said parts, the clamping means including a plurality of fasteners passing through at least some of said holes, each fastener having a first closing part and a second closing part between which are situated the sheets and the structural element, the trough-shaped parts and the profiled parts being so shaped that one of the parts is snugly interengageable with the associated part such that, where the parts are in contact with each other, loads transmitted, in use, between the sheet and the element are transmitted substantially by compression, that the parts are interengageable by simple insertion (as hereinbefore defined) of one of the parts into the other, and that the clamping means are, in use, stressed substantially only in tension.

4,412,757

VIBRATION MACHINE FOR COMPACTING MATERIALS, IN PARTICULAR AN EARTH COMPACTING MACHINE

Friedrich Kümmel, Esslingen-Sulzgries; Rudolf Hennecke, Remshalden-Buoch, Manfred Schubert, Kirchheim; Ludwig Unrath, Esslingen-Neckarhalde, all of, Fed. Rep. of Germany, Assignors to Delmag-Maschinenfabrik Reinhold Dornfeld GmbH & Co., Esslingen, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,123

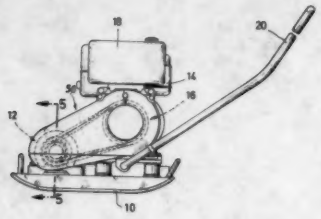
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033476

Int. Cl.³ E01C *19/38*

U.S. Cl. 404—113 **10 Claims**

10. A vibration machine for compacting materials such as earth comprising an imbalance system having first and second coaxial shafts, means mounting said shafts for independent rotary movement, a pair of unbalanced masses, first and second drive elements carried respectively by said shafts for rotation therewith, third and fourth drive elements secured respectively to said masses for rotation therewith, respective driving connections between said first and third drive elements and

between said second and fourth drive elements, a drive shaft and clutch means for selectively coupling said drive shaft to said first and second drive elements, characterized in that the unbalanced masses (**46**, **48**) are adjacent to each other in axial direction and are disposable in at least two angular positions relative to each other in accordance with the direction of drive to achieve different total imbalances, the unbalanced mass not



coupled with the drive shaft being taken along by the other unbalanced mass in at least one of said angular positions, and that for the angular position, in which the unbalanced masses (**46**, **48**) have the smaller angular space between them, a stop (**46***a*) carried by the first driven unbalanced mass for rotation therewith taking along the second unbalanced mass (**48**), this stop being disposed such that the first unbalanced mass (**46**) is ahead of the second unbalanced mass (**48**).

4,412,758

HYDRAULIC CONTROL MEANS

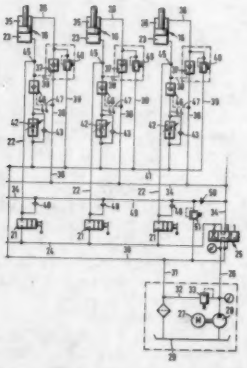
Herbert Heitkamp, Werne, and Walter Hohn, Selm-Borke, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed May 19, 1981, Ser. No. 265,206

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019290

Int. Cl.[3] **E21D** *9/06;* **F15B** *11/08*

U.S. Cl. 405—145 **9 Claims**



1. Hydraulic control means for controlling the advance rams of a tunnelling knife shield of the type having a plurality of knives positioned side-by-side on a support frame, the rams being positioned between the knives and the support frame, and each ram having first and second working chambers pressurisation of which is effective to extend and retract that ram, the hydraulic control means comprising respective first supply lines for supplying pressurised hydraulic fluid to the first working chambers, respective second supply lines for supplying pressurised hydraulic fluid to the second working chambers, and respective discharge lines for discharging hydraulic fluid from the first working chambers, wherein each discharge line is provided with a flow-regulation valve for controlling the retraction rate of the associated ram, and wherein each discharge line is provided with a pilot-operated check valve, the pilot line of which is connected to the second working chamber of the associated ram so that said check valve opens automatically when said second working chamnber is supplied with pressurised hydraulic fluid, each of the check valves being disposed between the associated flow-regulation valve and the associated first working chamber.

4,412,759

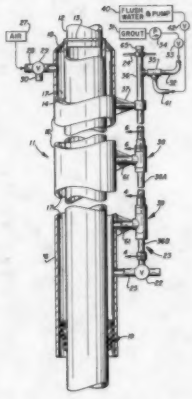
REACH ROD GROUTING SYSTEM

Frederick G. Britton, Bedford, and Don B. Landers, Arlington, both of Tex., assignors to Oil States Industries, Inc., Arlington, Tex.

Continuation-in-part of Ser. No. 904,747, May 11, 1978, abandoned. This application Jun. 23, 1980, Ser. No. 161,734

Int. Cl.[3] **E02B** *17/02;* **E02D** *21/00*

U.S. Cl. 405—225 **36 Claims**

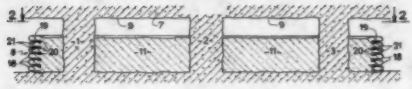


1. In an offshore marine pile and pile guide structure, generally in an upright orientation when installed in place, with piling driven into a bed at the bottom and on above water platform at the top: a pile guide sleeve adapted to receive a pile driven therethrough with an annulus formed between the sleeve and its pile; seal means set in place low in the annulus; flood valve means connected through fluid passage means to the interior of said annulus above said seal means; a reach rod structure including hollow piping, generally in upright orientation, having upper and lower ends, with the piping lower end connected to said flood valve means for controlled actuation of said flood valve means between open and closed valve positions; a grout supply system including grout feed line means connected to said annulus; wherein hollow piping of said reach rod structure is a part of said grout feed line means; said grout feed line means includes grout passage means interconnecting said reach rod structure hollow piping and said annulus; said grout passage means includes said flood valve means and said fluid passage means; and wherein said flood valve means is a three way valve that has open and close positions to flood water and a third position to feed grout through the flood valve and said fluid passage means to said annulus.

4,412,760
METHOD FOR PRODUCING A STRUCTURE HAVING COHESION BY MEANS OF A MATERIAL COMPRISING NON-COHERENT SOLID PARTICLES

Henri Vidal, 8 bis Boulevard Maillot, 92200 Neuilly sur Seine, France

Filed Feb. 11, 1981, Ser. No. 233,458
Claims priority, application South Africa, Feb. 13, 1980, 80/0816
Int. Cl.³ E02D *27/00, 29/02*
U.S. Cl. 405—267 **23 Claims**

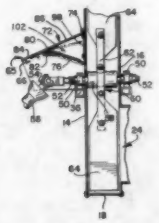


1. A method for consolidating at least one pillar of ground against collapse, said method comprising the steps of constructing around and in spaced relation to said at least one pillar a continuous wall of superimposed cladding elements having integral reinforcing means extending from said cladding elements toward said at least one pillar in a plurality of substantially horizontal vertically spaced-apart planes, filling the space between said wall and said at least one pillar with material including substantially non-coherent solid particles to frictionally contact said reinforcing means and constitute a frictionally stabilized structure that immediately protects said at least one pillar, said material including additional means which when mixed with said particles cause said material to set and become a cohesive structure, the time required for the setting of said material and the quality of said particles and said additional means of said material are not critical for the desired consolidation of said at least one pillar.

4,412,761
SELF-REGULATING AIR INLET

Robert Sorensen, Glen Ellyn; Edward A. Barrett, Glendale Heights, and Thomas J. Scarnato, Barrington, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Sep. 8, 1981, Ser. No. 299,903
Int. Cl.³ B65G *53/58*
U.S. Cl. 406—98 **10 Claims**



1. A self-regulating air inlet assembly in a material handling apparatus for conveyance of the material comprising:

said apparatus having a housing with a material feed inlet, discharge conduit and a rotatable central member conveying the material from said feed inlet into said discharge conduit;

an air conducting means connected with said apparatus;

said air conducting means facilitating the entry of a secondary air flow supplementing principal air flow entering said apparatus through said material feed inlet;

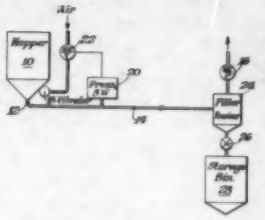
said air conducting means having a movable door displaceable by pressure differential between the housing outside and inside pressures created by the reduction of the air pressure inside of said housing; and

said secondary air flow automatically compensating a continuously varying air need caused by intermittent material feeding affecting supply of said principal air flow.

4,412,762
PNEUMATIC UNLOADING OF PARTICULATES

Richard H. Lepley, Easton, and Thomas A. Happel, Nazareth, both of Pa., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,301
Int. Cl.³ B65G *53/50*
U.S. Cl. 406—134 **6 Claims**



1. Apparatus for pneumatically unloading substantially dry particulate material from a storage hopper through a discharge line, which comprises:

impact vibration means for contacting said hopper adjacent the discharge outlet thereof;

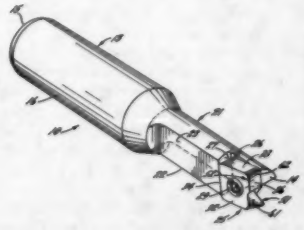
means for creating a pressure differential between said hopper and a point in said line downstream of said outlet; and

means for activating said vibration means when said pressure differential is at a first set value and deactivating said vibration means when said pressure differential is at a second set value, whereby a substantially continuous flow of said material thru said line is maintained.

4,412,763
DRILL WITH SINGLE CUTTER

Fred T. Shallenberger, Jr., Caledonia, Ill., assignor to Metal Cutting Tools, Inc., Rockford, Ill.

Filed Jan. 21, 1981, Ser. No. 266,734
Int. Cl.³ B23B *27/16*
U.S. Cl. 408—224 **7 Claims**



1. A drill for drilling a substantially cylindrical hole of predetermined diameter in a workpiece, said drill having an elongated body adapted to be rotated in a predetermined direction about a predetermined axis coinciding with the axis of the hole, said body having a shank end and a tip end, a single drilling cutter on the tip end portion of said body, said cutter being defined by a single and substantially flat wafer of cutting material in the shape of a substantially equilateral polygon, means

for releasably securing said cutter to the tip end portion of said body, said cutter having first and second cutting faces which face oppositely of one another but which both face in the direction of rotation, the tip end of said cutter having a first cutting edge adjoining said first cutting face and extending outwardly from one side of said axis toward the periphery of said cutter through a total predetermined effective radial cutting distance less than the radius of said hole whereby said first cutting edge cuts only the center portion of said hole when said body is rotated, and the tip end of said cutter having a second cutting edge adjoining said second cutting face and extending inwardly from the outer periphery of the cutter toward the other side of said axis through a total effective radial cutting distance equal to the difference between the radius of said hole and said first-mentioned predetermined effective radial cutting distance whereby said second cutting edge cuts only the peripheral portion of said hole when said body is rotated, the combined total effective radial cutting distances of said first and second cutting edges being no greater than the radius of said hole, said first and second cutting edges being formed along one side of said polygon, and a second pair of first and second cutting edges formed along another side of said polygon and identical to the first and second cutting edges of the first pair.

4,412,764

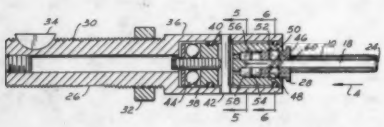
DOUBLE ENDED TAP

Walter W. Wawrzyniak, 39230 Gary, Mt. Clemens, Mich. 48043

Filed Nov. 10, 1980, Ser. No. 205,799

Int. Cl.³ B23B *31/08, 31/12;* **B23G** *11/00;* **B25G** *3/20*

U.S. Cl. 408—226 **9 Claims**



1. A double ended elongated cutting tool having longitudinally extending flutes in the surface thereof over at least a portion of both ends thereof, a tool holder having an axially extending recess in one end thereof including at least one radially extending recess in the inner surface having a frusto conical surface converging outwardly of the axially extending recess for receiving either end of the cutting tool and a quick disconnect coupling operable between the cutting tool and tool holder for releasably securing either end of the cutting tool to the tool holder comprising a hollow cylindrical member having a smooth cylindrical inner surface adapted to be sleeved over either end of the cutting tool and positioned within the recess in the one end of the tool holder between the cutting tool and the tool holder, transverse openings extending radially through the hollow cylindrical member, radially movable balls positioned in the transverse openings in the hollow cylindrical member extending into the radially extending recess in the inner surface of the axially extending recess in the tool holder and engaging the tool holder on the frusto conical surface in the radially extending recess and the cutting tool in the flutes thereof with the hollow cylindrical member in a limiting position extending out of the tool holder to lock the cutting tool within the axially extending recess in the tool holder against axial movement with respect to the tool holder, resilient means operable between the bottom of the axially extending recess and the hollow cylindrical member urging the hollow cylindrical member into its limiting position extending out of the tool holder and means operable between the tool holder and cutting tool for preventing relative rotation between the tool holder and cutting tool.

4,412,765

APPARATUS FOR FACILITATING CHAMFERING/DEBURRING TOOL AND GEAR MESHING

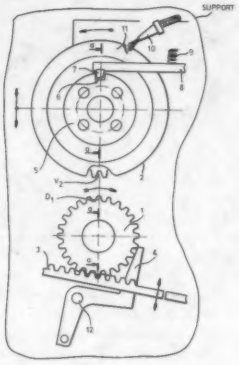
Carlo Occhialini, Bologna, Italy, assignor to Samputensili S.p.A., Bologna, Italy

Filed Jan. 12, 1981, Ser. No. 224,031

Claims priority, application Italy, Jan. 9, 1980, 3305 A/80

Int. Cl.³ B23F *19/06;* **B23Q** *7/00*

U.S. Cl. 409—6 **10 Claims**



1. An apparatus for mutually positioning a toothed chamfering/deburring tool and a gear to be worked, said apparatus comprising:

a rack for meshing with said gear and providing a guide therefor, whereby said gear rolls along said rack;

a stop disposed along said rack for engaging a gear rolling therealong in a predetermined position of the gear relative to said tool;

a first rotary detent member formed on said tool;

a second detent member engageable with said first detent member for locating said tool in a predetermined angular position in which teeth of said tool and said gear can mesh when said tool and said gear are moved into engagement; and

a nozzle for directing a stream of liquid against at least one tooth of said tool for rotation thereof until the engagement of said first and second detent members, said first and second detent members and said rack and gear respectively being disengageable upon the meshing engagement of said tool and said gear.

4,412,766

APPARATUS FOR CHUCKING AND RELEASING OF A CONICAL SHANK OF A TOOL OR AN ADDITIONAL AGGREGATE ON TOOL MACHINES, IN PARTICULAR DRILLING AND MILLING MACHINES

Rolf Eckstein, Rödental, Fed. Rep. of Germany, assignor to Werkzeugmaschinenfabrik Adolf Waldrich Coburg GmbH & Co., Coburg, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 214,834

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 7935975[U]

Int. Cl.³ B23B *31/04;* **B23C** *5/26*

U.S. Cl. 409—233 **11 Claims**

1. In combination with a tool machine adapted for use with a tool means having a conical shank and an internally threaded opening in said conical shank, an apparatus for chucking and releasing said tool means, comprising:

hollow spindle carriage means supported for movement toward and away from an unchucked tool means;

an elongated hollow spindle rotatably supported in the inte-

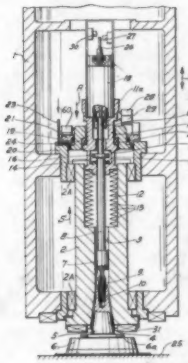
rior of said spindle carriage means and having a receiving cone at one end thereof adapted to receive said conical shank of said tool means therein;

an elongated draw bar rotatably and axially movably mounted in said spindle carriage, and having an externally threaded portion at the end thereof adjacent the end of said spindle facing said tool means;

first means for rotatably driving said draw bar to effect a full threaded engagement of the threads on said externally threaded portion of said draw bar and in said internally threaded opening and for drawing said conical shank tightly into said receiving cone to thereby effect a chucking of said tool means; and

second means for effecting, when said tool means is chucked in said spindle, a release of the connection between said conical shank and said receiving cone without altering said full threaded engagement between said externally threaded portion and said internally threaded opening whereby the weight of said tool means will be suspended from said full threaded engagement, said second means including:

a hollow spindle sleeve axially reciprocally movably



mounted in said spindle carriage means for movement a first distance toward and away from said hollow spindle, said spindle sleeve having third means defining a cavity therein with opposed axially facing surfaces thereof defining stop surfaces;

said draw bar extending through said cavity means and having an enlarged collar means located in said cavity means between said opposed stop surfaces;

a limiting of said axial movement of said draw bar relative to said spindle sleeve to a second distance less than said first distance when said tool means is chucked due to a limiting engagement of said collar means with at least one of said stop surfaces; and

drive means for reciprocally driving said spindle sleeve axially toward and away from said hollow spindle and effecting, during a movement of said spindle sleeve toward said hollow spindle, an engaging of said at least one stop surface with said collar means whereby a continued axial movement of said spindle sleeve toward said hollow spindle will effect an axial movement of said draw bar toward said receiving cone to effect said release of the connection between said conical shank and said receiving cone.

4,412,767

TOOL HOLDER

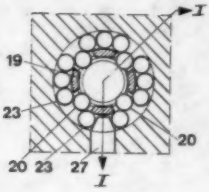
Herbert Schmid, Renningen, and Ernst Schmid, Ditzingen, both of Fed. Rep. of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

Filed Aug. 27, 1980, Ser. No. 181,749

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 7907796

Int. Cl.³ B23C *9/00*; **B23B** *31/00*

U.S. Cl. 409—234 **2 Claims**



1. A mounting device for securing a tool holder to a drive spindle, comprising an adapter which, in use, is attached to the drive spindle and carries the tool holder, the adapter being provided with a central recess having at least one inner guiding surface for guiding a rearwardly projecting portion of the tool holder, said portion projecting rearwardly past said guiding surface, and clamping means arranged to apply a rearwardly directed force on an abutting surface on the tool holder for clamping the latter against the adapter, said clamping means and said tool holder being separate members, said abutting surface extending transversely relative to the longitudinal axis of the tool holder, and being positioned axially behind said guiding surface, said clamping means comprising a plurality of elements engaging said abutting surface at circumferentially spaced locations, said elements being radially movable relative to said adapter while maintaining clamping relationship with said abutting surface to compensate for eccentricity of the latter, wherein said elements comprise a first series of rollers arranged for engagement with the abutting surface, a second series of rollers positioned radially outwardly of the first series, and a clamping member arranged to move apart two consecutive rollers in the second series by a wedge action such that said second series of rollers urge said first series of rollers radially inwardly into engagement with said abutting surface.

4,412,768

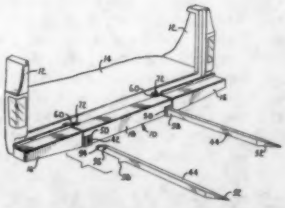
TRUCK BUMPER INCORPORATING HAY HANDLING DEVICE

Michael J. Bauer, R.R. #1, and Alphonse H. Bauer, P.O. Box 13, both of Freeburg, Mo. 65035

Filed Jan. 10, 1983, Ser. No. 457,023

Int. Cl.³ B66F *9/065*

U.S. Cl. 414—24.5 **20 Claims**



1. A bale carrying device for attachment to a truck, said device comprising:

a rear bumper;

a frame carrying said rear bumper thereon, said frame being adapted for attachment to the truck to mount said bumper thereon in the customary rear bumper position;

means for connecting said bumper with said frame in a manner permitting the bumper to pivot about a generally horizontal axis between a normal position and a bale carrying position, said bumper being constructed to function in the manner of a customary rear truck bumper in the normal position;

power means for readily effecting pivotal movement of said bumper between the normal and bale carrying positions; said power means and said frame being located beneath a load bed of the truck in a noninterfering position to permit free access to the load bed;

a pair of spears each having a sharp tip for piercing a hay bale; and

means for removably connecting said spears with said bumper at spaced apart locations to project generally horizontally therefrom to the rear in the normal position of the bumper for impaling the bale, said spears extending generally vertically above the bumper in the bale carrying position,

whereby the truck can be backed toward the bale with said bumper in the normal position to drive said spears into the bale and said power means can be operated to move the bumper to the bale carrying position to raise the bale for transport.

4,412,769

APPARATUS FOR CENTERING ALIGNMENT OF PLANAR WORKPIECES

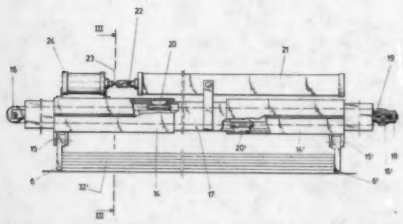
Horst Kollmann, Dornbirn, Austria, assignor to Firma Schelling & Co., Schwarzach, Austria

Filed Mar. 27, 1981, Ser. No. 248,481

Claims priority, application Austria, Mar. 28, 1980, 1711/80

Int. Cl.³ B65H *31/38*

U.S. Cl. 414—36 **7 Claims**



1. Apparatus for alignment of planar workpieces on a support table comprising: pivotable stop members adapted to engage said workpieces along the edges thereof; a beam extending in length over at least the dimension of the largest workpiece to be aligned; supports mounted on said beam for movement in the longitudinal direction thereof, each of said supports having mounted thereon at least one of said pivotable stop members; endless cable means circumambulating said beam and having said supports attached thereto; and piston-cylinder means having at least one of said supports connected thereto, the action of said piston-cylinder means being directed in the longitudinal direction of said beam; wherein said beam is in the form of an I-beam having a horizontal web and flanges, wherein there is provided in the plane of said web on the outer side of said flanges profiled battens operating as tracks for rollers arranged on said supports and wherein in the central area on both sides of said web there are arranged battens with longitudinal grooves serving as guide tracks for said endless cable means.

4,412,770

CHARGING OF COKE OVENS AND METHOD

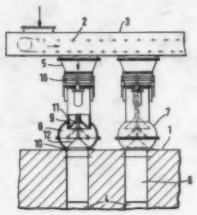
Manfred Galow, Essen, and Nikolaus Stefancik, Düsseldorf, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Fed. Rep. of Germany

Continuation of Ser. No. 142,143, Apr. 14, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,587

Claims priority, application Fed. Rep. of Germany, May 4, 1979, 2918005

Int. Cl.³ C10B *31/04*

U.S. Cl. 414—162 **15 Claims**



1. Apparatus for charging particulate coal into charging holes in the ceiling of a coke oven from a conveyor above the ceiling and through passages formed by depending funnels having their lower ends connected to charging tubes, comprising first means for compensating stresses acting between the conveyor and the coke oven ceiling, said first means being a compensator interposed between the funnel and charging tube of a respective passage; second means in said passages for selectively permitting and blocking the flow of coal to the charging holes; third means also in said passages for blocking the escape of gases from the charging holes, said second and third means comprising respective closure elements each having a surface which faces away from, and also tapers in direction away from, the respective charging hole, said closure elements of said second means being mounted in the vicinity of the lower ends of the funnels, said charging tubes each having an upper cylindrical part communicating with the lower end of the funnel, and a plurality of lower tubular chute parts connected to a lower end portion of said cylindrical part and merging with each other in the vicinity of said lower portion; and a diverter flap movable between a plurality of diverting positions in which it diverts coal from the funnel to different ones of said lower chute parts.

11. A method of charging particulate coal into charging holes in the ceiling of a coke oven from a conveyor above the ceiling and through passages formed by depending channels connected to charging tubes through which particulate coal flows in a predetermined direction and extending from the conveyor to the charging holes and each having a stress compensating element, a coal-flow controlling element and a gas outflow-controlling element therein, and wherein each charging tubes has an upper cylindrical part communicating with the lower end of the funnel, and a plurality of lower tubular chute parts connected to a lower end portion of the cylindrical part and merging with each other in the vicinity of the lower portion, the method comprising the steps of compensating stresses acting between the conveyor and the coke oven ceiling at a location immediately downstream of the funnels in the coal flow direction; moving the respective gas outflow-controlling element, at a location downstream of the coal-flow controlling element and in immediate vicinity of the respective charging hole, to a position in which the respective charging hole is unblocked; thereupon moving the coal-flow controlling element, at a location downstream of the stress compensating element in the coal flow direction and upstream of the gas outflow-controlling element, to a position in which coal can flow from the conveyor into the charging holes; moving the coal-flow controlling element to a position in which the flow

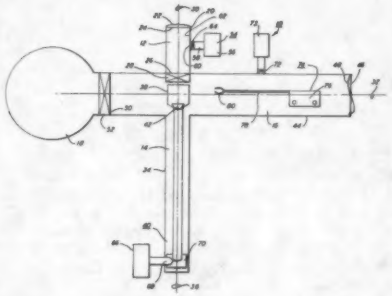
of further coal is blocked, upon completion of the charging; returning the gas outflow-controlling element to a position in which the charging hole is blocked to prevent the escape of raw gas from the coke oven; and moving a diverter flap between a plurality of diverting positions in which it diverts coal from the funnel to different ones of the lower chute parts; and operatively connecting the respective gas outflow-controlling elements with the flap to move between the blocking and unblocking positions in response to movement of the flap to different ones of said diverting positions.

4,412,771

SAMPLE TRANSPORT SYSTEM

Robert L. Gerlach, Minnetonka; David D. Seibel, Lakeville, and Mark C. Miller, Chanhassen, all of Minn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 30, 1981, Ser. No. 288,439
Int. Cl.³ B65G *51/02*
U.S. Cl. 414—217 **19 Claims**



1. A transport system useful for introducing and conveying a plurality of workpieces within an ultra-high vacuum apparatus, said system comprising:

means for retaining a plurality of workpieces in a stacked spaced relationship;

means for selectively positioning said retaining means within said apparatus;

means for conveying a selected workpiece from said retaining means to a processing chamber; and

means for interlocking said retaining means and said positioning means; said interlocking means including a platform assembly having a surface upon which said retaining means can be positioned;

said interlocking means further including at least one pawl which, when said retaining means is positioned on said assembly surface, extends into a recess in the bottom of said retaining means and which, when said assembly is urged toward said retaining means, grasps an internally extending shelf within said recess.

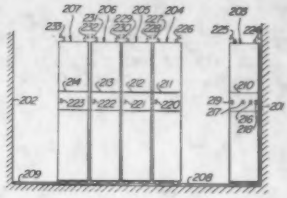
4,412,772

SHIFTABLE ARTICLE STORAGE DEVICE

Han-Ichiro Naito, Akishima; Tsuneo Yamaguchi, Tokyo, and Kiyoshi Harashima, Ome, all of Japan, assignors to Elecompack Company, Ltd., Tokyo, Japan

Division of Ser. No. 124,726, Mar. 16, 1971. This application Feb. 17, 1981, Ser. No. 234,949
Claims priority, application Japan, Mar. 17, 1970, 45-22501; Jun. 29, 1970, 45-56748; Jul. 14, 1970, 45-61662; Dec. 28, 1970, 45-125408
Int. Cl.³ A47B *53/00*; A47F *3/08*; B65G *1/00*
U.S. Cl. 414—331 **13 Claims**

1. A shiftable article storage device comprising a plurality of article storage units each movably arranged on a floor and disposed to be put together with no space left between adjacent storage units when access to them is not desired, while a selected one of them is shifted to create an aisle between itself and the adjacent storage unit when access to said selected one or ones of said storage units is desired; wherein each of said



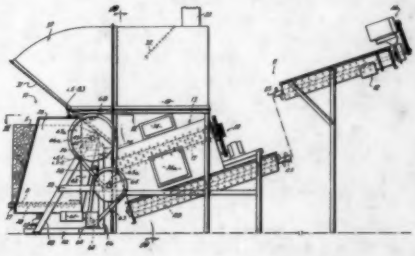
article storage units is provided with a motor to shift it in two directions toward the adjacent article storage units and control means to control the amount of movement of said storage units so that at least two desired aisles may be automatically formed at different locations between said storage units.

4,412,773

CONTROL APPARATUS AND METHOD FOR DUMPING TOBACCO

Edwin Wilding, Louisville, and James W. DeVere, Jeffersontown, both of Ky., assignors to Griffin & Company, Inc., Louisville, Ky.

Division of Ser. No. 61,748, Jul. 30, 1979, Pat. No. 4,348,148. This application Apr. 15, 1982, Ser. No. 368,674
Int. Cl.³ B65B *21/02*
U.S. Cl. 414—403 **2 Claims**



1. Control apparatus for a dumper having drive means to move it between a first position and a second dump position, a movable element connected to and moving with said dumper and a movable brake element having brake drive means for selectively operatively engaging said brake element with said movable element to hold said dumper in said second position, said control apparatus comprising,

means for operating said drive means to move said dumper to said second position,

means for operating said brake drive means for causing said brake element to engage and to hold said movable element in response to said dumper arriving at its second position,

timer means operating responsive to a control input for moving said dumper from its second to its first position,

means for operating said brake drive means to withdraw said brake element from said movable element in response to said control input, and

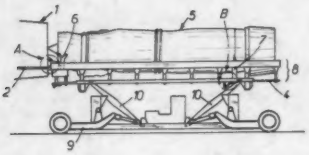
means responsive to the operation of said timer means and to the withdrawal of said brake element for moving said dumper from its second to its first position.

4,412,774

APPARATUS FOR THE INSTALLATION OF A JET ENGINE IN AN AIRCRAFT COMPARTMENT

Paul J. Legrand, Vaux le Penil; Andre R. Notheaux, Palaiseau; Guy R. Pachomoff, Corbeil-Essonnes, and Alexis M. G. Romanoff, Cesson, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.-M.A.", France

Filed Mar. 16, 1981, Ser. No. 244,311
Claims priority, application France, Mar. 19, 1980, 80 06102
Int. Cl.³ B66F *19/00*
U.S. Cl. 414—589 14 Claims



1. Apparatus for the installation of a jet engine having a casing in an aircraft compartment comprising: a plurality of longitudinal guide rails in said compartment capable of cooperating with a plurality of runners supporting said engine, said apparatus being characterized by that it comprises at least means for the displacement and placing of the engine including at least two lateral guide rails (3) and a median, lower guide rail (4); a foldable and removable front cradle (6) carrying at least two roller elements (20), capable of being attached to the front of the engine casing, the two roller elements cooperating with the two lateral guide rails (3) and the longitudinal guide rails (2) mounted inside the compartment; a removable rear cradle (7) equipped with a roller element (51), capable of being attached to the rear of the engine casing, said element cooperating with the lower median guide rail (4); a frame (8) to which at least the lateral guide rails are adjustably attached; means (10) for the vertical displacement of the frame (8); means for the longitudinal displacement (9) of the frame (8).

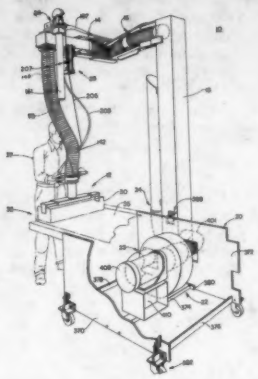
4,412,775

VACUUM ASSISTED MACHINE FOR HANDLING ARTICLES

Edwin A. Molitor; Norman P. Crowe, both of Clermont, and Guy W. Lampe, Hamilton, all of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed Mar. 10, 1982, Ser. No. 356,786
Int. Cl.³ B66F *11/00*
U.S. Cl. 414—626 5 Claims

1. A machine for assisting in the support of a load which comprises a suction head having a hollow interior, a conduit connected to the hollow interior, means for impressing suction on the conduit, there being a downwardly facing opening in the suction head, the opening being arranged to receive the load with the load closing the opening and the load engaging the head at the opening, cable means supporting the suction head, a pressure cylinder having a piston connected to urge the cable means upwardly to support the suction head and the load, means for supplying fluid under pressure to the pressure cylinder at two selected pressures, one selected pressure being sufficient to substantially counterbalance the weight of the load and of the suction head, the other selected pressure being a lesser pressure sufficient to substantially counterbalance the weight of the suction head, a pressure operated switch connected to the conduit and arranged to impress the first selected pressure on the pressure cylinder when the opening in the suction head is closed by the load and there is a reduced pressure in the conduit and to impress the lesser selected pressure



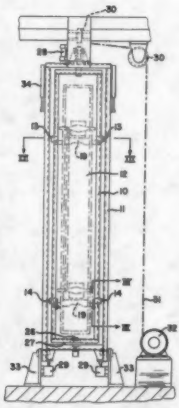
on the pressure cylinder when the opening in the suction head is free of the load and the suction is released.

4,412,776

APPARATUS FOR OVERHAULING AND REPAIRING DOORS OF HORIZONTAL COKE-OVEN BATTERIES

Hans-Jurgen Kwasnik, Herne, and Hans-Gunter Piduch, Bochum, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 323,975
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044848
Int. Cl.³ C10B *25/14*
U.S. Cl. 414—684.3 4 Claims



1. Apparatus for overhauling and repairing doors of a horizontal coke-oven battery, said doors each having first and second door-lifting beams which are separate and apart from the locking mechanisms for said doors and which extend horizontally outward from the sides of each door, said apparatus comprising, in combination:

a first frame having in sides thereof first and second pairs of pocket means for receiving ends of said door-lifting beams,

a second frame surrounding said first frame,

pivot means connecting said first and second frames to per-

mit said first frame to swivel about its central vertical axis within said second frame,

means for swiveling said second frame about a horizontal axis at the vicinity of its bottom, and

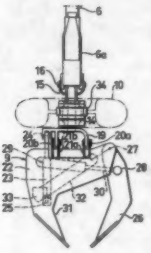
clamping means associated with at least one of said pairs of pocket means for securing said ends of said door-lifting beams therein.

4,412,777

DEVICE FOR A FELLING AND GRIPPING UNIT

Erik T. Forslund, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden

Filed Mar. 25, 1981, Ser. No. 247,244
Claims priority, application Sweden, Apr. 2, 1980, 8002548
Int. Cl.³ A01G *23/08*; E02F *3/32*
U.S. Cl. 414—694 6 Claims



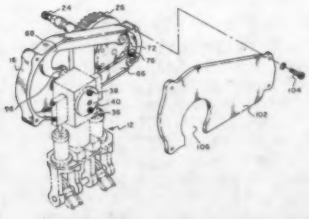
1. Apparatus for suspending a tree felling and gripping unit on a jib, said unit having a frame, said apparatus comprising: a rotator between the jib and a felling and gripping unit for rotation of said unit relative to the jib, said rotator having a stationary portion and an inner portion rotatable about an axis, said rotatable portion having a lower end; a horizontal axle pivotally suspending the stationary portion of the rotator from the jib; first hydraulic means connected between the jib and the stationary portion of the rotator for swinging the rotator about said horizontal axle; a further axle extending perpendicularly to the rotation axis of the rotatable portion of the rotator and pivotally suspending the frame of said unit from the lower end of the rotatable portion of the rotator; and second hydraulic means connected between said rotatable portion of the rotator and the frame of said unit for swinging said unit about said further axle.

4,412,778

TONG ARM ASSEMBLY

William Wenz, Millville, N.J., assignor to Jeff Company, Inc., Millville, N.J.

Filed Jul. 13, 1981, Ser. No. 282,892
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—733 2 Claims



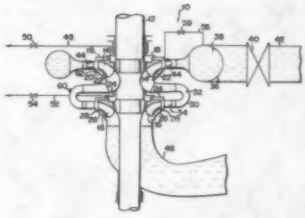
1. In a tong arm assembly for carrying and moving a tong head arcuately between two horizontally spaced positions while maintaining the orientation of said tong head, said tong arm assembly including a housing; means for rotating said housing about an arm stud passing into said housing adjacent one end thereof; means including a shaft for rotatably mounting a tong head to a second end of said housing; air passage means between said stud, said housing, said shaft and said tong head, and means within said housing interconnecting said stud and said tong head so as to maintain the orientation of said tong head while the same is being arcuately moved, the improvement comprising: said interconnecting means including a first rigid lever, one end of said first lever being pivotally connected to said arm stud at a point which is a first fixed radial distance from the axis of said stud, the other end of said first lever being pivotally connected to said tong head at a point spaced from the axis of said shaft the same first fixed radial distance, the angular positions of said points with respect to their respective stud and shaft axes being the same and a second rigid lever pivotally connected to each of said arm stud and said tong head at second points which are located at second fixed radial distances from the respective axes, the angular distances between the first mentioned and second pivot points with respect to said stud axis and with respect to said shaft axis being the same, one of said levers being curved at one end thereof so as to prevent interference with the stud or shaft with which it is associated.

4,412,779

CONTROL METHOD FOR MULTI-STAGE HYDRAULIC MACHINE

Sachio Tsunoda, Yokohama, and Shinsaku Sato, Ebina, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 27, 1982, Ser. No. 343,215
Claims priority, application Japan, Feb. 3, 1981, 56-13799
Int. Cl.³ F01D *17/00*
U.S. Cl. 415—1 9 Claims



1. A control method for a multi-stage hydraulic machine which comprises a rotatable shaft; a plurality of runners fixed to said shaft and arranged from a highest-pressure stage to a lowest-pressure stage; runner chambers in which are respectively housing said runners; a return channel for connecting adjacent ones of said runner chambers with each other; movable wicket gates provided at least in said highest-pressure stage and capable of moving between a position in which said movable wicket gates block the channel and a position in which said movable wicket gates open the channel; and a casing connected to said highest-pressure stage, said method comprising

a first step of causing said movable wicket gates to block the channel;

a second step of feeding air to said runner chamber of the highest-pressure stage to lower a water level in the channel below said runner chamber of the lowest-pressure stage;

a third step of operating upon said machine for idling said shaft in a direction for the desired mode of machine operation; and

a fourth step of shifting a mode of operation of said shaft to a turbine generating or pumping operation,

said fourth step including

a first process of feeding highly pressurized water in said casing through a feed water pipe to an outer circumferential portion of said runner chamber of the highest-pressure stage defined inside of said movable wicket gates when said movable wicket gates are completely closed, whereby said runner chamber of the highest-pressure stage is sequentially filled with water from the outer circumferential portion to a middle portion thereof and consequently the air remaining therein is compressed;

a second process of feeding the water in said runner chamber of the highest-pressure stage through said return channel to the lowest-pressure stages sequentially;

a third process of initiating exhaustion of compressed air in said runner chamber of the highest-pressure stage when said return channel adjacent to said runner chamber of the highest-pressure stage is substantially filled with water;

a fourth process of stopping exhaustion of the compressed air when said runner chamber of the highest-pressure stage reaches an underwater cut-off state and simultaneously initiating exhaustion of the compressed air from said runner chamber of the adjacent lower-pressure stages sequentially;

a fifth process of stopping exhaustion of the compressed air when each runner chamber of the lower-pressure stage reaches the underwater cut-off state;

a sixth process of terminating feeding of the highly pressurized water from said casing when the water pressure in said runner chamber of the highest-pressure stage reaches a predetermined level; and

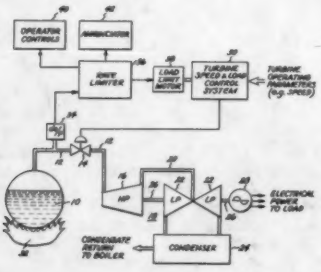
a seventh process of driving said movable wicket gates to a predetermined opening.

4,412,780

RATE INITIAL PRESSURE LIMITER

David J. Collins, and James E. Van Doren, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,529
Int. Cl.³ F01D *17/08*
U.S. Cl. 415—17 **10 Claims**



1. In combination with a steam turbine and a turbine speed and load control system, said steam turbine supplying power to a load and operating in a sliding pressure mode of operation wherein a steam generator supplies pressurized steam to said turbine through steam control valves which are positioned fully open during the normal sliding mode of operation, and the turbine's speed and load demand is met by causing said steam generator to increase or decrease as required by said turbine's speed and load demand, a control system for protecting the turbine against the effects of sudden changes in the steam supply pressure, comprising:

pressure sensing means providing a signal indicative of the pressure of said pressurized steam while said turbine is operating in said sliding mode;

rate sensing means providing a rate signal indicative of the time rate of change of said pressure signal;

rate limit detection means providing a correction signal whenever said rate signal exceeds a preselected rate value corresponding to said sudden change in pressure; and

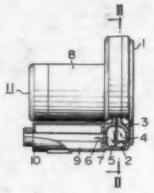
means responsive to said correction signal to generate and impose a load limit value on a load limit motor connected to said turbine speed and load control system, and said speed and load control system responding to said motor by positioning said control valves in a direction to counteract said change in pressure in opposition to said valve's normal position during said sliding mode of operation while said speed and load control system substantially maintains the speed of the turbine at a preselected value.

4,412,781

VORTEX BLOWER

Masahiro Abe, Chiba, and Masayuki Fujio, Yachio, both of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Jul. 21, 1981, Ser. No. 285,554
Claims priority, application Japan, Jul. 21, 1980, 55-98755
Int. Cl.³ F04D *29/66*
U.S. Cl. 415—53 R **14 Claims**



1. A vortex blower comprising:

a casing;

an annular air passageway defined in said casing;

an impeller means mounted for rotation in said casing;

a partition wall means extending into said annular air passageway in a direction of said impeller to arcuately partition said annular passageway;

a suction port and a discharge port respectively disposed on a suction side and a discharge side of said partition wall means, said suction port and discharge port being in communication with each other through said annular air passageway;

an extension wall formed by extending at least one wall surface of said partition wall means along a surface of rotation said impeller, said extension wall tapering in a direction extending outwardly from the partition wall means; and

at least one projecting wall extending into the annular passageway is connected to said at least one wall surface of said partition wall means and connected to an inner wall surface of the air passageway in a vicinity of said partition wall means.

4,412,782

FULL HOOP BLEED MANIFOLDS FOR LONGITUDINALLY SPLIT COMPRESSOR CASES

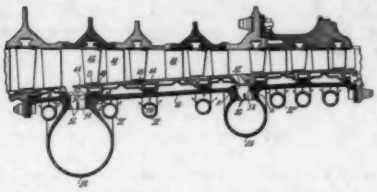
William G. Monsarrat, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 28, 1979, Ser. No. 24,635
Int. Cl.³ F01D *5/08, 5/18, 11/00, 25/08*
U.S. Cl. 415—175 **4 Claims**

1. In an axial flow gas turbine engine of the type having rotor and stator elements and wherein the stator element includes a longitudinally split compressor case, the improvement comprising:

a compressor case having an integrally formed manifold of circular cross section extending circumferentially about

the exterior of the case and across the longitudinal split in the case and having a plurality of circumferentially spaced ports extending into the manifold from the interior of the case; and



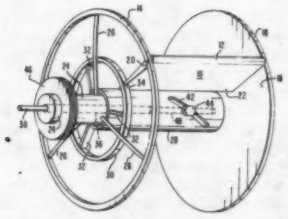
means for thermally controlling the diameter of the case including apparatus capable of discharging cooling air against the case beneath the circular cross section manifold.

4,412,783

CENTRIFUGAL FAN WHEEL WITH CHANGEABLE PITCH BLADES

John W. Barlass, Janesville, Wis., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Oct. 8, 1981, Ser. No. 309,860
Int. Cl.³ F01D 5/22
U.S. Cl. 416—186 A 4 Claims



1. In an air-moving centrifugal fan wheel having an air inlet area including a drive shaft, opposed wheel end means including outer peripheral ring means, as related to said shaft; and connected to the shaft for driving movement, and a series of fan blades spaced around the wheel, each of said blades having opposite ends, a radially outer edge and a radially inner edge portion, an arrangement for varying the pitch of the blades comprising:

means securing said opposite ends of said radially outer edges of said blades to said outer peripheral ring means;

an outer tube encompassing said drive shaft in rotatable relation therewith;

openwork grid means fixedly connected to said outer tube for rotation therewith and having an outer peripheral portion engaging said radially inner portions of said blades for shifting said inner portions in one or another circumferential direction to vary the pitch of said blades in accordance with rotation of said outer tube relative to said drive shaft; and

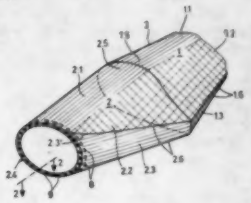
means for changing the rotative relationship of said outer tube and said drive shaft to accordingly change the pitch of said blades.

4,412,784

MONOCOQUE TYPE ROTOR BLADE

Peter-Martin Wackerle, and Michael Hahn, both of Ottobrunn, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 26, 1982, Ser. No. 342,907
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103710
Int. Cl.³ B64C 27/46, 27/48, 11/26
U.S. Cl. 416—230 9 Claims



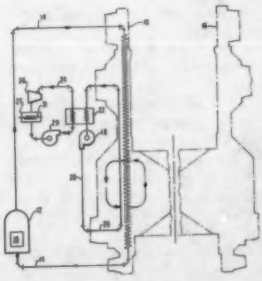
1. A rotor blade constructed as a shell or monocoque, comprising a root section (2) and a wing section (1) having a wing tip and a wing end (1.5) with a given cross-section connected to said root section (2), each of said sections (1, 2) having a leading edge zone (1.1; 2.1), a trailing edge zone (1.3; 2.3) and two intermediate zones (1.2; 2.2) connecting the leading and trailing edge zones, said intermediate connecting zones (1.2; 2.2) comprising reinforcing fibers extending in a cross-over relationship relative to one another, said leading and trailing edge zones each comprising reinforcing fibers extending unidirectionally and substantially in parallel to one another in each respective leading edge and trailing edge zone, said root section (2) having a connecting end (2.4) of substantially circular or elliptical cross-section for securing the rotor blade to a rotor hub, and a radially outer end (2.5) connected to said wing end (1.5) and having a cross-section corresponding to said given cross-section, said trailing edge zone (2.3) of said root section having curved extensions (2.3') at said connecting end (2.4), said curved extensions (2.3') reaching substantially toward said leading edge zone (2.1) of said root section (2) at said connecting end (2.4), whereby said intermediate zones (2.2) of the root section (2) form gussets between the leading edge zone and the trailing edge zone.

4,412,785

PUMPING APPARATUS

Walter G. Roman, Belleair Bluffs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

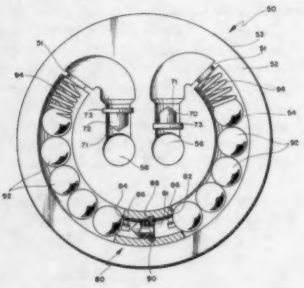
Filed Mar. 19, 1981, Ser. No. 245,490
Int. Cl.³ F04B 19/00
U.S. Cl. 417—50 5 Claims



1. Apparatus for pumping plural conductive fluids, comprising:

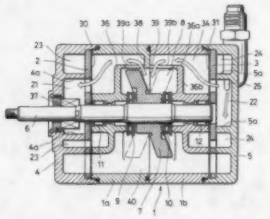
a generally cylindrical inner shell;
a generally cylindrical outer shell concentrically spaced about said inner shell so as to form an annular region therebetween;
a plurality of tube sets, each said tube set including a plurality of tubes positioned radially between said inner shell and said outer shell, with a flow space between each said tube set and its adjacent tube set, each said tube having an inlet and an outlet;
a pole positioned inside of said inner shell;
a pole piece positioned outside of said inner shell;
excitation windings positioned inside of said inner shell;
a permanent magnetic material positioned inside of said inner shell for creating a magnetic flux path radially across a portion of said annular region;
means for pumping a first conductive fluid through said flow spaces between said tube sets; and
means for flowing a second conductive fluid to said tube inlets;
whereby as a result of the interaction among said first pumped conductive fluid, said flux path, and said second conductive fluid, said second fluid is pumped through said tubes and said conducting means.

4,412,786
POSITIVE DISPLACEMENT PUMP
John C. Perry, 3170 Falcon Dr., Carlsbad, Calif. 92008
Filed Nov. 12, 1981, Ser. No. 320,456
Int. Cl.³ F04F 7/00
U.S. Cl. 417—241 **1 Claim**



1. A positive displacement fluid pump actuated by a clockwise, counterclockwise rotary motion comprising:
a housing, said housing forming fluid inlet and fluid outlet means,
an annular channel, circular in cross section, formed by said housing, a first end of said annular channel is in fluid communication with said inlet, a second end of said annular channel is in fluid communication with said fluid outlet means formed in said housing,
a first one-way valve means, positioned in said channel between said fluid inlet means in said housing and said first end of said channel,
a second one-way valve means positioned in said channel between said fluid outlet means in said housing and said second end of said channel,
a first free-moving piston weight mass positioned about halfway between said first and second ends of said channel, said piston forming a passageway therethrough, a third one-way valve means being retained within said passageway by said piston means,
a source of fluid connected to said fluid inlet, and
a source of rotary osctillatory energy adjacent said housing, said rotary oscillatory motion rotates said housing clockwise and counterclockwise at varying rates of oscillation, as said positive displacement piston weight mass moves away from said first inlet end of said annular channel, fluid is drawn through said first one-way valve means into an expanded area behind said piston, as said piston reverses direction, said fluid passes through the third one-way valve within said piston into a chamber adjacent said second end of said annular channel, as said piston again reverses direction, the third valve closes in the piston and fluid is forced out past said second one-way valve nearest said outlet end of said housing, thereby pumping fluid through said positive displacement pump.

4,412,787
SWASH-PLATE TYPE COMPRESSOR HAVING AN IMPROVED LUBRICANT OIL FEEDING ARRANGEMENT
Hiroshi Kondo, and Tsunenori Shibuya, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Saitama, Japan
Filed Sep. 28, 1981, Ser. No. 306,249
Claims priority, application Japan, Oct. 6, 1980, 55-139601
Int. Cl.³ F04B 1/16, 1/18
U.S. Cl. 417—269 **12 Claims**



1. In a swash-plate type compressor of the type having a pair of cylindrical members joined together in axial alignment and forming a cylinder block; a pair of cylinder heads secured to opposite ends of said cylinder block, said cylinder heads having first and second low pressure chambers defined therein, respectively, said first low pressure chamber having a refrigerant gas suction port opening therein; a pair of valve plates interposed between said cylinder block and said cylinder heads; means defining a suction passageway extending through said cylinder block and said valve plates at a radially outer location in said cylinder block for guiding suction refrigerant gas from said first low pressure chamber to said second low pressure chamber; and means defining a swash plate chamber at a substantially central location in said cylinder block, said swash plate chamber accommodating a swash plate secured on a drive shaft and engaging pistons slidably received within cylinder bores of said cylinder block for causing reciprocating motions of said pistons; said suction passageway defining means and said swash plate chamber defining means including a partition wall partitioning said suction passageway from said swash plate chamber, the improvement comprising a refrigerant gas deflecting wall provided across said suction passageway and radially extending, said deflecting wall being located on substantially the same plane with the axial center of said swash plate chamber, said deflecting wall extending substantially at right angles to the direction of flow of refrigerant gas travelling in said suction passageway to divide said suction passageway into an upstream side and a downstream side; said partition wall having an axially extending portion and a radially extending portion, said axially extending portion of said partition wall being formed with an opening communicating said suction passageway with said swash plate chamber; said opening being divided into an upstream side and a downstream side with respect to said deflecting wall, said upstream side and said downstream side of said opening being located on the same axial plane; said refrigerant gas deflecting wall and said partition wall being in a positional relationship such that refrigerant gas travelling in said suction passageway is guided toward said refrigerant gas deflecting wall along said radially

extending portion of said partition wall and deflected by said refrigerant gas deflecting wall at said upstream side of said suction passageway, hence guided through said opening in said partition wall into a substantially axially central zone in said swash plate chamber, and thereafter delivered from said swash plate chamber into said downstream side of said suction passageway through said opening in said partition wall.

4,412,788

CONTROL SYSTEM FOR SCREW COMPRESSOR

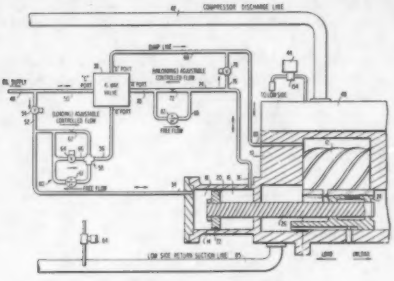
David N. Shaw, Unionville, Conn., and David J. First, Carlisle, Mass., assignors to Durham-Bush, Inc., West Hartford, Conn.

Filed Apr. 20, 1981, Ser. No. 255,410

The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.

Int. Cl.³ F04B *49/02*

U.S. Cl. 417—280 **22 Claims**



1. In a screw compressor system including a helical screw compressor having a compressor section including intermeshed screw rotors, a motor for driving said rotors, a compressible working fluid output line and an inlet line for said compressor, a slide valve movable relative to said compressor rotors for varying the capacity of said compressor and a hydraulic piston and cylinder assembly, a source of hydraulic fluid, said piston dividing said cylinder into an inboard and an outboard section and being coupled to said slide valve, the improvement comprising:

valve means connected to said cylinder assembly for controlling hydraulic pressure application to said piston;

means for sensing the working fluid pressure in said compressor inlet line;

means for sensing loading of said motor;

a control circuit responsive to both said means for sensing pressure and said means for sensing motor loading to selectively pulse said valve means to thereby move said piston and vary the capacity of said compressor; and

a time delay circuit associated with said control circuit, an unload solenoid interposed between said source of hydraulic fluid and the outboard section of said cylinder, said time delay circuit actuated upon initiation of power to said motor to provide an output signal of limited time duration to said unload solenoid for supplying hydraulic fluid to said outboard section while bypassing said valve to drive said piston in a first direction and unload said compressor section.

4,412,789

OIL PUMP UNIT

Takeshi Ohe, and Hiroshi Ohsaki, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

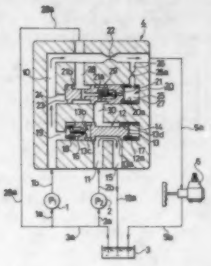
Filed Oct. 5, 1981, Ser. No. 308,762

Claims priority, application Japan, Oct. 31, 1980, 55-154470; Jan. 24, 1981, 56-9457

Int. Cl.³ F04B *49/08*

U.S. Cl. 417—288 **10 Claims**

1. An oil pump unit comprising a first and a second pump for separately discharging a hydraulic fluid, a main passage for supplying the hydraulic fluid from the first pump to a hydraulic apparatus, a first switching valve normally connecting the second pump with a tank, the first switching valve being responsive to an increased load on the hydraulic apparatus to disconnect the second pump from the tank to connect the second pump with the main passage through a one way valve,



and a second switching valve operative whenever a flow of the hydraulic fluid from the main passage exceeds a given value to vent part of the hydraulic fluid to the tank from the main passage and operative to connect the second pump with the tank if the first switching valve is operated under this condition.

4,412,790

BALANCED SUPPLEMENTAL WATER BLEED FOR SUCTION DREDGERS

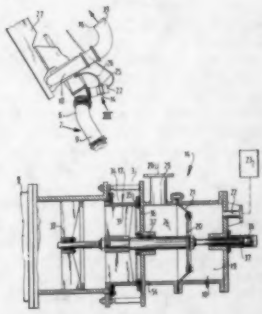
Thomas J. Ruyter, Schagen, Netherlands, assignor to Ballast-Nedam Groep N.V. and Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V., both of Amstelveen, Netherlands

Continuation of Ser. No. 83,284, Oct. 10, 1979, abandoned. This application Oct. 13, 1981, Ser. No. 310,749

Claims priority, application European Pat. Off., Nov. 3, 1978, 78200287.7

Int. Cl.³ F04B *49/10*

U.S. Cl. 417—306 **4 Claims**



1. In a suction dredger system including a pump having an inlet and an outlet, suction conduit means connected to said inlet for sucking up a suspension of dredging spoil in water and spoil delivery conduit means connected to said outlet for conveying said suspension from the pump, the improvement which comprises:

valve means for bleeding supplemental water into the system adjacent to the inlet of said pump when the suction pressure at said inlet deviates from a preset pressure value; and

actuating means responsive to the pressure at said inlet for progressively decreasing the amount of water supple-

mented by said valve means as the pressure at said inlet increases with respect to said preset value and for progressively increasing the amount of water supplemented by said valve means as the pressure at said inlet decreases with respect to said preset value, said actuating means comprising a chamber and a movable wall dividing said chamber into first and second compartments, means for subjecting one compartment to negative pressure less than said preset value and means for subjecting the other compartment to the pressure at said inlet of the pump.

4,412,791

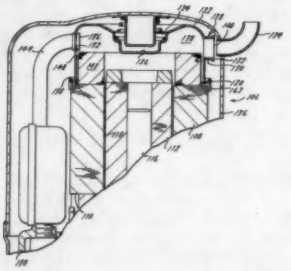
REFRIGERATION COMPRESSOR APPARATUS AND METHOD OF ASSEMBLY

Mahendra Lal, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 10,749, Feb. 9, 1979, abandoned, which is a continuation of Ser. No. 767,325, Feb. 19, 1977, abandoned. This application Nov. 17, 1980, Ser. No. 207,611

Int. Cl.³ F04B *35/04*

U.S. Cl. 417—312 **10 Claims**



1. A refrigeration motor/compressor comprising:

a hermetic shell having a suction gas inlet;

compressor means within said shell;

an electric motor having a rotor drivingly connected to said compressor means and a stator having one axial end engaging said compressor means:

a shroud fastening device engaging the opposite axial end of said stator;

fasteners securing said shroud fastening device and said stator to said compressor means;

a shroud member enclosing said opposite axial end of said stator and having an inlet opening therethrough, said shroud fastening device retaining said shroud in position;

a tubular member having one end secured to said shroud in communication with said inlet opening and the opposite end outwardly flared; and

at least one conduit member external of said motor for communicating suction gas from said shroud to said compressor means, whereby said tubular member and said conduit member cooperate to direct suction gas from said suction gas inlet to said compressor means across said opposite end of said motor to thereby cool said motor and attenuate the noise of said suction gas.

4,412,792

INTENSIFIER PUMP WITH INTEGRATED CHECK VALVE

Russell G. LaBorde, Shorewood, and Gary S. Jendrzejek, Milwaukee, both of Wis., assignors to The Oilgear Company, Milwaukee, Wis.

Filed Jan. 21, 1981, Ser. No. 227,168

Int. Cl.³ F04B *21/00*

U.S. Cl. 417—454 **2 Claims**

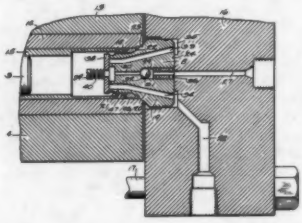
1. A check valve partially inserted in an end of an intensifier cylinder and partially in an end head for said cylinder, said intensifier cylinder having a piston for reciprocating therein to make a pumping stroke and a suction stroke that alternately intensifies the pressure of a low viscosity fluid for passage through a coaxial discharge passage through said check valve and a supply of low pressure low viscosity fluid for passage through an inlet passage spaced laterally of said high pressure discharge passage through said check valve;

said cylinder having an end with an annular surface tapered inwardly to a bore of said cylinder;

said check valve having a small diameter portion extending within said cylinder, a large diameter portion extending out of said cylinder, and an intermediate portion having a tapered annular outer surface joining the cylindrical surfaces of said small and large diameter portions and mating with said tapered end surface of said cylinder, said small diameter portion that extends within said cylinder defines an annular space therebetween, said large diameter portion extends into a recessed bore in said end head and in abutment with a bottom of said recessed bore in said end head;

an annular member fitted in said annular space between said small diameter portion of said check valve and said cylinder and in mating abutment therewith, internal fluid pressure within said cylinder and said annular space acting axially on said annular member urging said annular member axially toward the end of said cylinder in fluid tight engagement with said check valve and said cylinder;

a valve seat located within said high pressure discharge passage intermediate the ends thereof at a point within a radial plane through an inner edge of abutment of said



tapered surfaces of said cylinder and check valve, a check-member on said valve seat operates to discharge high internal pressure fluid through said coaxial discharge passage and to block discharged fluid from returning to said cylinder;

a check plate over the internal end face of said check valve, said check plate having a coaxial bore therethrough open to said discharge passage, said check plate resiliently mounted on said end face and held thereagainst by the pressure of fluid within said cylinder when it exceeds the pressure of supply fluid to block a port of said inlet passage and being displaced from said end face by the pressure of supply fluid when it exceeds the pressure within said cylinder;

bolt means axially securing said end head to said cylinder to force said end head against the check valve to axially compress said check valve and hold said mating tapered surfaces of said check valve and said cylinder against each other under compression force and a radial component of said compression force extends on and through said check valve in the radial plane of said abutting mating tapered surfaces;

the small diameter portion of said check valve is subject to the alternating high pressure within said cylinder, within said coaxial discharge passage up to said valve seat, and on the outer cylindrical surface of said small diameter portion of said check valve, whereby the radial compression forces within said cylinder of said alternating high pres-

sure offset the radial tension forces thereof in said coaxial discharge passage;

the large diameter portion of said check valve being outward of said valve seat is subject only to a constant high pressure and not to an alternating high pressure in the coaxial discharge passage and is therefore not subject to alternating stresses;

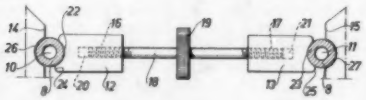
and the intermediate portion of said check valve within the radial plane of said mating tapered surfaces which radial plane includes said valve seat is a narrow radial plane through said check valve and is under a constant prestressed compression by said radial component of said axial compression forces on said tapered surfaces of said check valve and cylinder;

whereby the construction and arrangement of said cylinder and check valve minimize fatigue stresses in said check valve due to cyclic loading of high pressure in said cylinder and check valve.

4,412,793
PUMP INCLUDING LOCKING MEANS FOR A FLEXIBLE TUBE

Kaj O. Stenberg, Staffanstorp, and Lars H. Nyström, Veberod, both of Sweden, assignors to Cambro Lundia AB, Sweden

Filed Oct. 28, 1981, Ser. No. 315,924
Claims priority, application Sweden, Nov. 6, 1980, 8007803
Int. Cl.³ F04B *43/12*
U.S. Cl. 417—477 **15 Claims**



1. A pump for pumping a fluid through a flexible tube comprising a housing for at least a portion of said flexible tube, said housing including an inlet, an outlet, and means for progressively deforming said flexible tube from said inlet to said outlet for transporting said fluid therethrough, said inlet and said outlet including seat means for retaining said flexible tube, and said pump further including adjustable locking means mounted between said seat means for adjustably locking said flexible tube against said seat means, said adjustable locking means including common rod means having a first end and a second end, and a pair of slidable members mounted at said first and second ends of said common rod means, respectively, said pair of slidable members being simultaneously slidably movable towards said seat means at said inlet and said outlet, respectively, whereby said flexible tube may be adjustably retained between said slidable members and said seat means at said inlet and said outlet.

4,412,794
ULTRA-HIGH TORQUE ACTUATORS

Rex W. Presley, Livonia, Mich., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jan. 30, 1981, Ser. No. 230,161
Int. Cl.³ F01C *1/063*
U.S. Cl. 418—61 R **9 Claims**

1. An actuator comprising:

an output member rotatably mounted therein;

epicyclic transmission means, for driving said output member in response to forces input thereto;

rotor means, eccentrically mounted relative to the axis of rotation of said output member, and adapted to rotatably engage said transmission means; wherein said rotor includes radially projecting rectangular poles;

first means for producing on a specified member of said poles a force vector directed substantially perpendicular thereto;

reaction means for causing said rotor to move in an orbiting, non-rotating manner relative to said output axes, wherein said rectangular poles contain material reactive to magnetic forces and wherein said rectangular poles are located equidistant from one another; and wherein said first means includes:

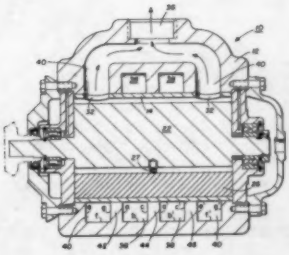
stator means responsive to electrical actuation signals for generating a magnetic field proximate to a predetermined number of said rectangular poles, said magnetic field

interacting with said predetermined number of poles and directed perpendicular to the radius vector from the center of said rotor means through each of said poles, said stator means including two stator poles oriented perpendicular to each of said rectangular poles, wherein each of said stator poles carries an electrical coil adapted to receive the electric actuation signal and wherein the plane of each electric coil is parallel to its respective rectangular pole.

4,412,795
VANE TYPE FLUID MOTOR MANIFOLD

Frank Adams, Waubaushene, Canada, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 4, 1980, Ser. No. 212,551
Int. Cl.³ F03C *2/00, 4/00*
U.S. Cl. 418—86 **11 Claims**



1. In a fluid motor having a housing with a bore therein, a liner within the bore, a rotor rotatably operably mounted in the housing and liner combination, the rotor being provided with a plurality of radially extending slots, and a blade mounted in each of the slots, the blades defining with the rotor and the liner a sealed chamber, inlet and outlet openings in the liner, the improvement comprising:

an inlet manifold having an inlet passageway from the exterior of the housing and communicating with two annular inlet chambers, each extending around the exterior of the liner with said chamber in communication with a liner inlet opening to pass fluid from the inlet to the interior of the liner;

an outlet manifold having an exhaust outlet passageway through the rotor housing communicating with two annu-

lar outlet chambers, each extending around the exterior of the liner with said annular outlet chamber being in communication with a liner opening to pass exhaust fluid from the interior of the liner to said exhaust outlet passageway; and

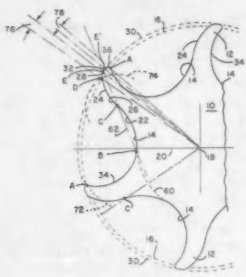
said annular inlet chambers and said annular outlet chambers each extending completely around said liner and each being defined between walls of said housing extending transverse to said liner and an internal housing surface facing said liner, wherein said walls provide for heat exchange between said liner and said housing and for heat exchange between inlet and exhaust fluids circulating through said inlet and outlet chambers.

4,412,796

HELICAL SCREW ROTOR PROFILES

James L. Bowman, Davidson, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 25, 1981, Ser. No. 296,035
Int. Cl.³ F01C *1/20, 1/16;* F04C *18/20*
U.S. Cl. 418—201 15 Claims



1. A rotor, having helical lands and intervening grooves rotatable about an axis for coacting engagement within a machine housing, with a cooperating, meshing rotor, in order that fluid admitted into such housing will be received in said grooves and, due to coacting mesh and rotation of said rotors, will have the pressure thereof altered, wherein:

each of said grooves has a leading flank and a trailing flank, relative to a given rotary direction of said rotor; and

said leading and trailing flanks of said grooves of said rotor are generally concave;

said leading flank is made up of a circular arc at its root, followed by an involute intermediate portion, followed by an elliptical portion which is contiguous with an outermost tip of said rotor.

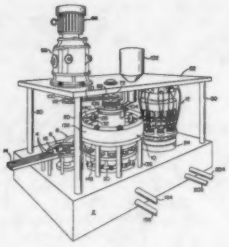
4,412,797

APPARATUS FOR FORMING A LINER IN A CONTAINER CLOSURE

Kashiwa Murayama, Fujisawa, Japan, assignor to Japan Crown Cork, Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 99,031, Nov. 30, 1979, abandoned. This application Feb. 4, 1982, Ser. No. 345,915
Int. Cl.³ B28B *5/00;* B29F *1/10*
U.S. Cl. 425—114 3 Claims

1. An apparatus for forming a liner in a container closure, said apparatus comprising: a container closure conveying means for conveying closures to be lined along a predetermined path including a liner stock feeding section and a liner stock molding section further along said path from said liner stock feeding section, said conveying means including means for continuously conveying the closure along a substantially arcuate path in the liner stock feeding section; an extruder at said liner stock feeding section for extruding a liner stock in the heated and molten state and having an annular shape into a container closure conveyed to the liner stock feeding section by said conveying means and positioning the annular liner stock in a predetermined location in the closure, said extruder including a heating means for melting the liner stock, a plurality of downwardly open annular extrusion openings arranged above the arcuate path and opening axially of the annular shape thereof, a plurality of shutoff members for changing the respective extrusion openings between a closed and an open condition, a barrel member having therein a space for heat-melting the liner stock, said barrel member being connected with said extrusion openings and said shutoff members, and means for turning said barrel member, said extrusion openings



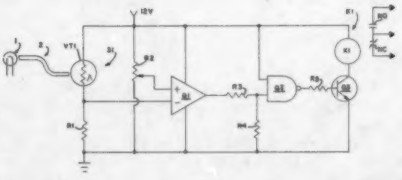
and said shutoff members continuously and synchronously with the movement of the closures being conveyed along the arcuate path with each of the extrusion openings conveyed along the arcuate path at a position directly above the closures; said heating means including an extruder screw in said space in said barrel member and means for rotating said extruder screw in a directon opposite to the direction of rotation of said barrel member; and a molding machine at said liner stock molding section for molding the liner stock in the closure conveyed to the liner stock molding section from the liner stock feeding section by said closure conveying means into the desired shape while it is still molten.

4,412,798

MOLD CLEAR DETECTOR

Frank J. Avellino, Russell, and John E. Hoffman, Warren, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 9, 1981, Ser. No. 319,773
Int. Cl.³ B29C *1/00, 11/00*
U.S. Cl. 425—137 3 Claims



1. In a mold machine system for fabricating plastic parts or parts from other suitable materials, a mold clear detector sensitive to the extraction or retention of parts from the mold cavity for inhibiting the operation of the mold machine as a result of the retention of parts upon completion of the mold machine cycle, said detector comprising:

a photocell adapted to be positioned in the mold so as to develop an optical signal in accordance with the retention or extraction of a part from the mold cavity upon completion of the mold machine cycle;

a light-dependent resistor;

a fiber optic cable coupling the photocell to the light-dependent resistor;

a comparator having an input coupled to the light-dependent resistor, said comparator responsive to the optical signal developed by the photocell; and

a switching circuit having an input coupled to an output of the comparator and an output adapted to be coupled to the mold machine, said circuit for inhibiting the operation of the mold machine as a result of the retention of parts upon completion of the mold machine cycle.

4,412,799

APPARATUS AND METHOD FOR STEREO RELIEF MODELING

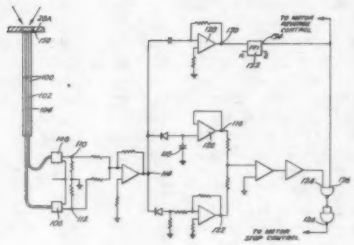
Jackson Gates, P.O. Box 145, Kylertown, Pa. 16847

Division of Ser. No. 20,105, Mar. 12, 1979, Pat. No. 4,252,514, Division of Ser. No. 759,159, Jan. 13, 1977, Pat. No. 4,148,645, which is a continuation-in-part of Ser. No. 557,612, Mar. 12, 1975, Pat. No. 4,005,932. This application Feb. 24, 1981, Ser. No. 237,693

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.[3] **B29C** *1/02;* **G03B** *21/00, 21/56;* **G01C** *11/12*

U.S. Cl. 425—150 **12 Claims**



1. An apparatus for automatically adjusting the level of at least one surface point on a flexible platen of a photogrammetry apparatus having photogrammetric images projected thereon in first and second colors, comprising:

means for respectively receiving and transmitting said first and second colored images at said at least one surface point attached to said platen at said at least one surface point, said platen being movable together with the receiving and transmitting means:

means for vertically positioning said receiving and transmitting means;

means for converting said transmitted colored images into electrical signals, said signals being proportional in strength to the intensities of said colored images at said at least one surface point: and,

means for controlling said positioning means in response to said electrical signals, whereby said at least one surface point of said platen is adjusted to a position where said colored images intersect.

4,412,800

MOLD ASSEMBLY FOR COMPRESSING REFRACTORY MATERIAL AND INCLUDING A QUICK CHANGE MOLD BOX

Robert J. Dorsey, 8554 S. Kenneth Ave., Chicago, Ill. 60652

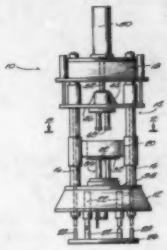
Division of Ser. No. 965,794, Dec. 4, 1978, Pat. No. 4,265,610. This application Mar. 9, 1981, Ser. No. 241,769

The portion of the term of this patent subsequent to Jan. 12, 2000, has been disclaimed.

Int. Cl.[3] **B28B** *3/08;* **B29C** *3/00*

U.S. Cl. 425—195 **26 Claims**

1. A mold assembly for use in a press and comprising a mold table having a central aperture, the boundary of said aperture being defined by a plurality of discrete portions, each of said portions sloping downwardly and outwardly, a mold box positionable in said central aperture, said mold box including at least one mold cavity therein, said mold box and said mold table being adapted to be supported in the press for relative movement between a position wherein said mold box is housed in said aperture and a position wherein said mold table is removed from said aperture, and means for releasably wedging said mold box in said central aperture when said mold table and said mold box are moved with respect to each other in the press to a position wherein said mold box is housed in said



central aperture, said means for releasably wedging including means for releasing said mold box when said mold table is moved in said press with respect to said mold box away from said position wherein said mold box is housed in said aperture, said means for releasably wedging including a plurality of wedges carried by said mold table within said aperture and adapted to surround said mold box, said wedges being positioned circumferentially around said aperture for releasably securing said mold box in said aperture, and means for forcing at least one of said wedges into clamping engagement with said mold box as said mold box is moved into said aperture.

4,412,801

PRESSED-BOARD PLANT WITH MULTILEVEL PRESS

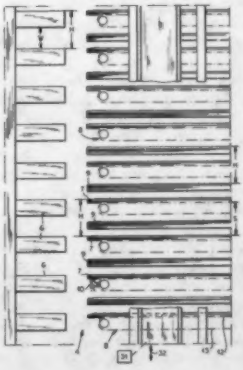
Jürgen Pesch, Krefeld-Traar, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed May 1, 1981, Ser. No. 259,675

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016850

Int. Cl.[3] **B29J** *5/08;* **B29C** *3/04*

U.S. Cl. 425—338 **3 Claims**



1. In an apparatus for the production of pressed board wherein pressable materials on respective press underlays are

pressed between the platens of a multiplaten press, and pressed boards on respective press underlays are transferred to discharge platforms of a discharge rack adjoining the press, the discharge platforms being disposed substantially at levels corresponding to the levels of the platens of said press in an open condition thereof, said discharge rack having transfer means for transferring the boards on the respective underlays, the improvement wherein said rack is provided with a multiplicity of storage platforms interleaved with said discharge platforms and spaced apart corresponding to the spacing of the upper surfaces of said platforms, said transfer means being operable selectively to transfer said pressed boards on respective underlays onto said discharge platforms and onto said storage platforms, and means for shifting said rack between one rack position in which the upper surfaces of said discharge platforms are coplanar with the upper surfaces of respective platens and another rack position in which the upper surfaces of said storage platforms are coplanar with respective platens.

4,412,802

MOLDING DEVICE FOR FORMING A SOCKET END ON A PLASTIC PIPE METHOD

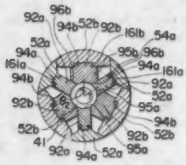
Ryozo Ohta; Tadao Yoshizawa; Masayuki Sakaguchi; Yoshiaki Hara; Junsuke Kyomen; Ryuichi Yoneda, and Hidekazu Enomoto, all of Ishizukita, Japan, assignors to Kubota Ltd., Osaka, Japan

Division of Ser. No. 80,035, Sep. 28, 1979, Pat. No. 4,279,853. This application Apr. 1, 1981, Ser. No. 250,036

Claims priority, application Japan, Oct. 3, 1978, 53-122326; Nov. 28, 1978, 53-147402; Mar. 5, 1979, 54-25899

Int. Cl.³ B29D *23/00*

U.S. Cl. 425—392 **6 Claims**



1. A molding device for processing the end of a plastic pipe to form a pipe end socket comprising:

a plurality of core pieces divided in a ring to form an inner molding surface for processing the pipe end socket; and

means for expanding and/or contracting the core pieces to form an inner molding surface upon expanding and/or to allow the core pieces to pass through a processed shape of the pipe end socket upon contracting wherein said expanding means further comprises:

a guiding shaft upon which said core pieces are mounted;

first and second finger members, each having a bottom face portion sliding and supported on said guiding shaft, and also having an upper face portion;

said plurality of core pieces further comprising at least a first and second core piece corresponding to first and second finger members, respectively, bottom face portions of said core pieces being slidably supported by the respective upper face portions of said first and second finger members for shifting between expanded and contracted positions, and an upper face portion of said first and second core pieces having an inwardly slanted portion formed thereon for forming the pipe end socket upon expanding of said first and second core pieces;

first and second restraining ring members for combining and supporting end sides of said first and second finger members, respectively, wherein said second restraining ring member is housed within said first restraining ring member; and

means for moving one of said first and second restraining ring fingers a first predetermined distance;

means for moving the remaining ring member of said first and second restraining ring members a second predetermined distance after moving said one ring member of said first and second restraining ring members said first predetermined distance, wherein the core piece moved by said first finger member is radially outwardly or inwardly shifted to different positions on said guiding shaft a predetermined time which differs in time with respect to the movement of the core piece moved by said second finger member, such that the radially outermost portion of said inwardly slanted portion of said first and second core pieces is positioned radially inwardly of a radially innermost surface portion of the processed pipe end socket.

4. A molding device for processing the end of a plastic pipe to form a pipe end socket comprising:

first and second divided core pieces contacted alternately in a ring to form an inner molding face for a processing and molding space,

first and second finger members corresponding to the first and second divided core pieces, respectively, each finger member having a tapered upper face freely slidably engaged with each respective first and second divided core piece allowing said divided core pieces to be raised or lowered in the radial direction of the pipe, and also having a bottom face;

first and second ring-shaped restraining members which further comprise ring-shaped end portions of each of said first and second finger members, one of said first and second ring-shaped restraining members having a circumferential side thereof in contact with corresponding side portions of said first and second divided core pieces;

a guiding shaft having a guiding surface slidably contacted with each bottom face of said first and second finger members, and

an operation member including means for moving a remaining ring-shaped member of said first and second ring-shaped restraining members a first predetermined distance and means for moving said one of said first and second ring-shaped restraining members a second predetermined distance after said remaining ring-shaped member of said first and second ring-shaped restraining members is moved said first predetermined distance, wherein the divided core pieces moved by one of said first and second finger members is raised or lowered at different positions on said guiding shaft at a point in time which differs relative to the divided core pieces being moved by the other of said first and second finger members such that through use of the force exerted from the pipe, the divided core pieces, around which the heat softened plastic pipe is fed, enable the bottom faces of said first and second finger members to be self-locked into the guiding shaft through the tapered faces thereof whereby the inner molding face formed by the divided core pieces is stabilized.

4,412,803

ADJUSTABLE SUPPORT BRACKET FOR CONCRETE FINISHING EQUIPMENT

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Continuation-in-part of Ser. No. 34,171, Apr. 26, 1979, Pat. No. 4,316,715. This application Jan. 27, 1982, Ser. No. 343 283

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ E01C *19/38*

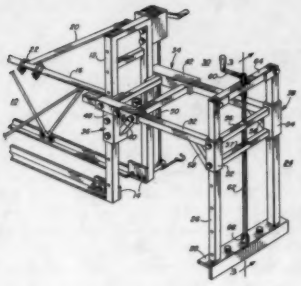
U.S. Cl. 425—456 **17 Claims**

1. An adjustable support bracket for supporting an end of equipment for finishing a concrete surface including an obstruction extending vertically from the edge area, said adjustable support bracket comprising:

a. support means including a vertically extending member for engaging a load bearing surface positioned outboard of the

concrete surface and for permitting translation of said bracket along the load bearing surface; and

b. adjustment means including a laterally extending member coupled to the end of said equipment and to said support means for maintaining lateral spacing between said end of said equipment and said support means and for permitting



the contact point between said support means and the load bearing surface to be vertically adjustable while maintaining the end of said equipment in a fixed vertical position, whereby the end of said concrete finishing equipment operates inboard of the vertically extending obstruction while being supported by the load bearing surface located outboard of the concrete surface.

4,412,804

APPARATUS FOR INJECTION MOLDING OF PRECISION PARTS

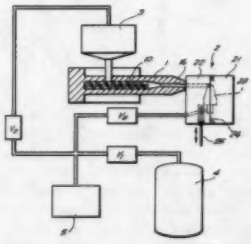
Werner Hüther, Karlsfeld, Fed. Rep. of Germany, assignor to MTU Motoren-Und Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,282

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042052

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—546 **6 Claims**



1. Apparatus for injection molding of precision parts, comprising:

a material reservoir for containing material to be injected,

a tool having a mold cavity into which the material is injected to form the part,

an injection cylinder for receiving material from the reservoir,

an injection nozzle having a passageway therethrough between the injection cylinder and the mold cavity,

a plunger within the cylinder for pushing material in the cylinder through the nozzle passageway into the mold cavity,

evacuating means including a vacuum pump and a vacuum reservoir, the reservoir having a volume many times greater than that of the mold cavity,

a vacuum line through which the mold cavity can communicate with both the vacuum pump and the vacuum reservoir, said vacuum line being independent of said nozzle passageway, and

control valve means for selectively connecting the mold cavity to and disconnecting the mold cavity from the vacuum reservoir and for connecting the mold cavity to the vacuum pump even when the mold cavity is disconnected from the vacuum reservoir.

4,412,805

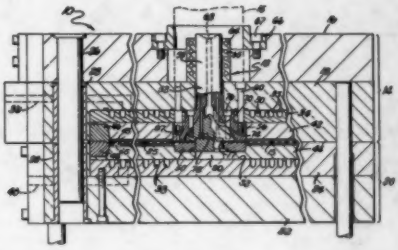
HOT SPRUE ASSEMBLY FOR AN INJECTION MOLDING MACHINE

Rocky V. Morrison, Redondo Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 272,432, Jun. 10, 1981, abandoned. This application Sep. 23, 1981, Ser. No. 304,422

Int. Cl.³ B29F *1/03*

U.S. Cl. 425—549 **36 Claims**



1. In an injection molding machine for producing centrally apertured record discs, apparatus for controlling flow of molten disc-forming material into a disc-shaped mold cavity, comprising:

a sprue assembly forming an open and relatively narrow gate for passage of the molten disc-forming material into the mold cavity, said gate being disposed in a plane recessed slightly from the general plane of the disc to be formed within the mold cavity;

said sprue assembly including a sprue bushing having a central bore formed therein for passage of the molten disc-forming material toward the mold cavity, and dispersion means having a plurality of relatively small extrusion passages formed therein, said dispersion means being mounted generally within the end of said bore adjacent said mold cavity for passage of the molten disc-forming material through said extrusion passages prior to passage through said gate; and

heater means for controlled elevation of the temperature of said sprue assembly to create a preselected temperature gradient between said sprue assembly and the mold cavity for permitting solidification of the disc-forming material within the mold cavity up to the gate without substantial solidification of disc-forming material within said sprue assembly.

4,412,806

PARISON EJECTOR FOR AN INJECTION MOLDING APPARATUS

William R. Gaiser, and James Niepoky, both of Dayton, Ohio, assignors to The Broadway Companies, Inc., Dayton, Ohio

Filed May 15, 1981, Ser. No. 263,946

Int. Cl.³ A23P *1/00*

U.S. Cl. 425—554 **26 Claims**

1. In an injection molding machine of the type having an

injector portion including a mold cavity module having a plurality of mold cavities communicating with a source of molten plastic material, an improved ejector portion comprising:

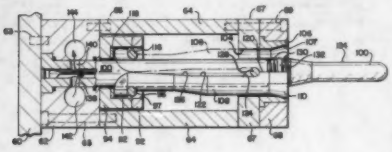
a platen mounted to said machine for reciprocating movement toward and away from said mold cavity module;

a frame mounted to said platen and extending toward said mold cavity module;

a plurality of cores mounted to said frame and extending toward said mold cavity module, said cores positioned to enter and withdraw from said mold cavities upon said reciprocating movement of said platen;

carriage plate means slidably mounted to said frame for movement toward and away from said platen and including a plurality of bores through which pass said cores;

a plurality of pairs of opposing jaws pivotally mounted to said carriage plate means, each of said pairs enclosing one



of said cores and forming complementary portions of a parison mold;

said pairs of jaws including mating longitudinal edges defining opposing bearing surfaces having a converging portion proximate said carriage plate means;

cam means mounted to said frame and positioned between said opposing bearing surfaces; and

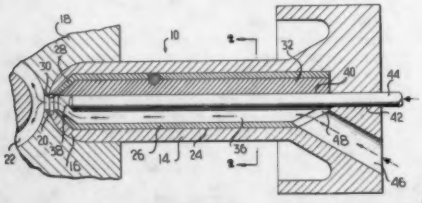
means for reciprocating said carriage plate means relative to said frame and cores such that movement of said carriage plate means away from said platen in an ejection sequence causes said jaws to move relative to said cores thereby removing molded parisons therefrom and causes said bearing surfaces to slidably engage said cam means whereby said cam means forces said pairs of jaws apart upon encountering said converging portions thereof so that said jaws release molded parisons from said mold portions thereof.

4,412,807

OFFSET FLOW INJECTION NOZZLE

Stuart A. York, Tariffville, Conn., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Jan. 28, 1982, Ser. No. 343,148
Int. Cl.³ B29F *1/05*
U.S. Cl. 425—564 **8 Claims**



1. An injection nozzle for effecting and controlling the flow of plastic material in melt form from a plasticizer to an injection mold, said nozzle comprising a hollow nozzle body having an end portion for seating in sealed relation in an injection mold, an axial delivery orifice opening through said body one end from the interior of said nozzle body, an axially positioned valve gate pin for selectively closing said delivery orifice, a separately formed combined support and guide member in said nozzle body mounting said valve gate pin for axial movement between a projected position closing said delivery orifice and a retracted position within said nozzle body spaced from said delivery orifice, and a unitary supply passage extending uninterruptedly through said nozzle body to said delivery orifice when said valve gate pin is in its retracted position whereby separation of and rejoining of flowing plastic material within said injection nozzle does not occur, said supply passage being disposed entirely to one side of said combined support and guide member.

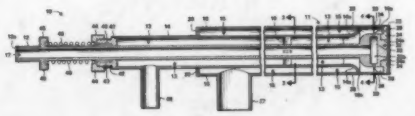
8. An injection nozzle for effecting and controlling the flow of plastic material in melt form from a plasticizer to an injection mold, said nozzle comprising a hollow nozzle body having an end portion for seating in sealed relation in an injection mold, an axial delivery orifice opening through said body one end from the interior of said nozzle body, an axially positioned valve gate pin for selectively closing said delivery orifice, combined support and guide means in said nozzle body mounting said valve gate pin for axial movement between a projected position closing said delivery orifice and a retracted position within said nozzle body spaced from said delivery orifice, and a unitary supply passage extending uninterruptedly through said nozzle body to said delivery orifice when said valve gate pin is in its retracted position whereby separation of and rejoining of flowing plastic material within said injection nozzle does not occur, said supply passage being disposed entirely to one side of said combined support and guide means, and said combined support and guide means having a tapered end leading transversely of said valve gate pin and across said delivery orifice, said support and guide means providing support for said valve gate pin for the full length of said valve gate pin.

4,412,808

DUAL FUELED BURNER GUN

Douglas B. Sheppard, Torrance, Calif.; James A. Kezerle, Cary, N.C., and Ellis W. Sheffield, Littleton, Colo., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 19, 1980, Ser. No. 160,790
Int. Cl.³ F23C *1/08*
U.S. Cl. 431—8 **13 Claims**



1. A dual fueled burner gun, including:

inner, intermediate, and outer tubes arranged concentrically to form an inner annular conduit between said inner and intermediate tubes and an outer annular conduit between said intermediate and outer tubes, and a nozzle at one end of said tubes having first, second, and third ports opening laterally of said tubes, said first ports communicating said inner tube to said inner conduit, said second and third ports communicating said inner and outer conduits, respectively, to the exterior of said gun.

4,412,809

OXYGEN DENSITY DETECTING DEVICE IN COMBUSTOR

Hiroshi Yamaguchi; Takashi Sekiguchi; Hideyuki Tsukahara; Nobumasa Negishi, and Kisuke Fujita, all of Gunma, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,504
Claims priority, application Japan, Jul. 1, 1980, 55-89474
Int. Cl.³ F23N *5/24*
U.S. Cl. 431—76 **4 Claims**

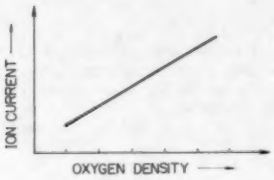
1. An oxygen density detecting device for a combustor,

which detects an ion current of flame to detect an oxygen density of air for combustion, comprising:

means for applying a reference current through said flame;

means for sensing an ion current in said combustor by detecting a voltage produced across said flame by said reference current;

memory means coupled to said sensing means for storing as a reference value an ion current value sensed by said sensing means a predetermined period of time after a flame is formed in said combustor;



means for determining and producing an output signal representing an oxygen density of air used for combustion by comparing said reference value stored in said memory means with ion current values subsequently and successively provided by said sensing means; and

means for controlling at least one of an electromagnetic pump for supplying fuel to said combustor and a combustion air blower for supplying air to said combustor in response to said output signal.

4,412,810

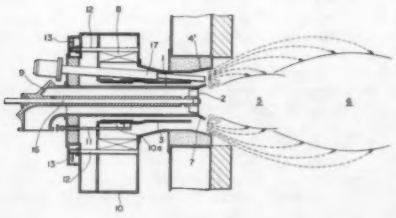
PULVERIZED COAL BURNER

Akira Izuha, Koganei; Tomoyuki Shinano, Yokohama; Yubo Shibayama, Chiba; Chikatoshi Kurata, Akashi, and Kenichi Fujii, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 4, 1981, Ser. No. 240,347

Int. Cl.³ F23C *5/06*

U.S. Cl. 431—186 **2 Claims**



1. A pulverized coal burner adapted to reduce undesired combustion waste gas, comprising;

a primary throat for supplying pulverized coal and primary air to a furnace, a flame sustaining plate located at the forward end of said primary throat and diverging outwardly therefrom so that the primary air and the pulverized coal are ejected at a relatively low speed from the primary throat to burn in the furnace at a low temperature for producing char and unburned components thereat,

a secondary throat located outside said primary throat concentrically therewith for supplying secondary air to the furnace, said secondary throat being movable back and further to adjust the spacing thereof relative to the flame sustaining plate for adjusting the rate of supply of the secondary air through the secondary throat into the furnace, and

a burner throat located outside said secondary throat concentrically therewith for supplying tertiary air to the furnace, said burner throat diverging outwardly at the forward end thereof to form a diffuser so that the tertiary air is directed together with the secondary air to diverge outwardly without substantially mixing with the primary air and the pulverized coal,

whereby the secondary air and the tertiary air burn at a low temperature with the char and unburned components previously burned in the furnace.

4,412,811

HIGH CAPACITY OIL BURNER

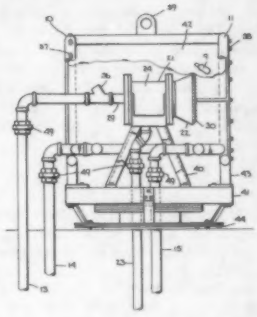
Oswaldo A. Pedrosa Junior; Nilton Castro Couto, and Raul C. Carvalho Fangueiro, all of Rio de Janeiro, Brazil, assignors to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

Filed Aug. 27, 1981, Ser. No. 296,904

Claims priority, application Brazil, Aug. 28, 1980, PI8005447

Int. Cl.³ F23D *11/02;* **F23J** *7/00*

U.S. Cl. 431—202 **2 Claims**



1. High capacity oil burner suitable for burning unwanted liquid fuels, comprising:

(a) an atomizer **(8)** including a chamber **(24)** for accumulating liquid fuels adjacent to a chamber **(28)** for accumulating compressed air which supplies primary air for the atomization of the liquid fuels at the time of burning, said chamber **(24)** for accumulating liquid fuels being provided with a plurality of discharge holes **(25,26)** on its front end, circumferentially positioned, which open to outside the chamber;

(b) a protective cylindrical housing **(42)** open at both ends which surrounds completely said atomizer, said housing having at each end a hollow circular ring **(10, 11)** provided in its external surface with respective holes **(37,38)**, each of said circular rings being connected to a water manifold **(14, 15)** which injects water under pressure into said rings **(10,11)** such that the water is expelled to the outside through said holes defining a fan-like water curtain around said cylindrical housing **(42)**;

(c) means for the admission of liquid fuels into said chamber for the accumulation of liquid fuels, means for the admission of compressed air into said chamber for the accumulation of compressed air and means for the admission of water into said perforated rings which surround the ends of said protective cylindrical housing; and

(d) means **(9)** to promote the ignition of said atomized liquid fuels that are expelled to the exterior of said chamber for the accumulation of liquids together with primary air;

characterised in that said chamber **(28)** for the accumulation of compressed air is defined by a frusto-conical hollow body having a conical side wall **(22)** which is at an angle from 10° to 35° with the longitudinal axis of the atomizer, and which is thick enough so that inside it are positioned holes **(25,26)** having the shape of straight cylindrical channels which communicate the interior of said chamber for the accumulation of liquid fuels with the outside; the front face of said

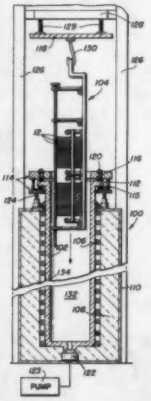
body being the smaller base of the frusto-conical body and being adjacent to the chamber (24) for the accumulation of liquid fuels and having a central hole where the conduction manifold (29) that receives the compressed air from outside the burner into said chamber (28) opens; said front face having a plate (31) that seals completely the opening at the larger base of the frusto-conical body; the inner surface of said conical side wall (22) having a plurality of elongated holes (27) that start inside the chamber (28) for the accumulation of compressed air and open to said elongated holes (25,26) which communicate the chamber (24) for the accumulation of liquid fuels with the outside; said fuel discharge holes (25,26) opening at the front end of the atomizer having nozzles (30) that surround said sealing plate (31) at the larger base of the frusto-conical body through which the atomized liquid fuel to be burnt is expelled; the atomizer (8) being positioned within said protective cylindrical housing (42) in such a manner that the front end of said atomizer is spaced apart from said cylindrical housing and the rear end of said atomizer is also spaced apart from the rear end of said cylindrical housing; the inner diameter of said cylindrical housing (42) being from 2 to 3 times the diameter of the front end of said atomizer and the length of said housing being from 1 to 1.5 times the length of said atomizer; the burning efficiency of the burner when measured by the number of barrels of fuel burnt as related to the weight of said burner expressed in kg being above 30 barrels of fuel burnt per day/kg of the apparatus, without producing any soot.

4,412,812

VERTICAL SEMICONDUCTOR FURNACE

Joseph P. Sadowski, Coppell; Alan E. Lightfoot, Dallas, and Jeffrey M. Kowalski, Coppell, all of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 28, 1981, Ser. No. 335,170
Int. Cl.³ F27B *9/00, 3/22;* F27D *5/00*
U.S. Cl. 432—121 **3 Claims**



1. A furnace for heating integrated circuit maerials, comprising:

a housing;

a quartz tube defining a cylindrical interior with vertical sidewalls and having a rim at its upper ends surrounding an opening into the interior and a port through its lower end for evacuating the interior;

a mounting plate secured to said housing through a plurality of adjustment screws and supporting said quartz tube about its rim;

a manifold secured in sealing relationship with said quartz tube about the opening thereof and further having an aperture therethrough aligned with the opening in said tube;

a cover for sealing engagement with said manifold to seal the interior of said quartz tube from the atmosphere;

heating means for heating the interior of said quartz tube;

a quartz boat for holding the integrated circuit materials for entering into the interior of said quartz tube; and

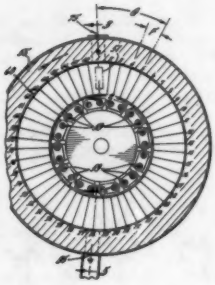
means for supporting and vertically moving said quartz boat into and out of the interior of said tube without contact between the sidewalls of the quartz tube and said quartz boat.

4,412,813

ROTARY HEARTH FURNACE AND METHOD OF LOADING AND UNLOADING THE FURNACE

Karl A. Wulf, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Feb. 2, 1982, Ser. No. 345,031
Int. Cl.³ F27D *3/00;* F27B *9/16*
U.S. Cl. 432—11 **18 Claims**



18. A method of operating a rotary hearth furnace having a heated chamber and having a rotatable hearth in said chamber for advancing workpieces around a circle, said hearth having a plurality of angularly spaced workpiece stations which are spaced equally from one another, said method comprising the steps of rotating said hearth in one direction within said chamber, and placing workpieces in said stations at said loading position, said method being characterized in that successive workpieces at said loading position are placed in non-adjacent stations during a first revolution of said hearth and are placed in intervening stations during a second revolution of the hearth.

4,412,814

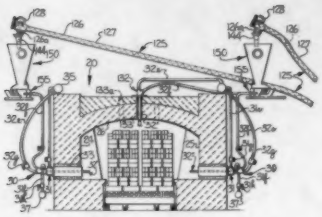
APPARATUS AND METHOD FOR OPERATING A BRICK KILN

Silas P. Dennis, Jr., and Tony M. Dennis, both of P.O. Box 279, Albemarle, N.C. 28001

Filed Dec. 21, 1981, Ser. No. 333,174
Int. Cl.³ F27B *9/00*
U.S. Cl. 432—146 **7 Claims**

1. In a kiln having an elongate housing defining a tunnel for the passage therethrough of brick to be treated, the combination therewith of apparatus for utilizing dried sawdust for the fuel to heat the kiln to effect the desired treatment of the bricks, said apparatus comprising a plurality of elongate sawdust burner units positioned along the housing and extending into the tunnel, each of said burner units comprising a pipe having an inner end extending into the tunnel of the kiln and an outer end, aspirator means communicatively connected to the outer end of the pipe, said aspirator means having a pair of outer connections, means for directing an airstream from a source into and through each of the burner units and comprising a first conduit means connecting one of said pair of outer

connections of said aspirator means to the source of the airstream, and means for directing dried sawdust from a source into the airstream in each of the burner units comprising a second conduit means connecting the other of said pair of



outer connections of said aspirator means to the source of the sawdust so that the airstream induces the flow of sawdust from the source of sawdust into each of the burner units and also serves to provide oxygen for combustion of the sawdust.

4,412,815

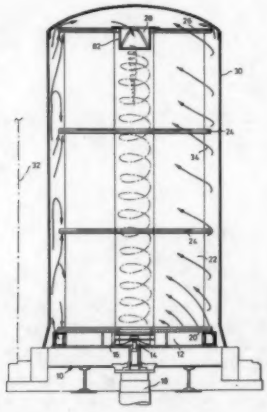
LOADING SYSTEM FOR AN ANNEALING FURNACE CHARGE AND COMPONENTS THEREFOR

James H. White, Manotick; Bernard C. Stonehill, Mississauga; Brian F. Johnston, Hamilton; Albert R. Perrin, Mississauga, and Roderick I. L. Guthrie, Westmount, all of Canada, assignors to Dofasco Inc., Hamilton, Canada

Filed Oct. 29, 1981, Ser. No. 316,182

Int. Cl.³ F27B *11/00;* **C21D** *9/00, 1/06*

U.S. Cl. 432—206 **7 Claims**



7. A lowermost diffuser member for use in a loading system for the charge of an annealing furnace of the kind employed for the treatment within a cylindrical inner muffle cover of a plurality of hollow-cored coils of metal products stacked inside the muffle cover one on top of the other with the hollow cores thereof registered vertically with one another, the said diffuser member comprising:

a circular back plate having at its centre an aperture for the reception of a gas impeller adapted to receive gas flowing axially from the said registered hollow cores of the coils and discharge it radially through the diffuser member,

the back plate having thereon a plurality of upstanding circumferentially-spaced diffuser elements providing between themselves a corresponding plurality of radially-outwardly extending gas flow passages from its centre to its periphery, the said passages conveying the impelled gas therethrough and discharging it radially and circumferentially into the annular space between the furnace muffle inner wall and the stacked furnace charge to move helically upward therein;

each said diffuser element comprising:

a radially inner diffuser element portion providing respective side wall portions of two adjacent flow path inlets and a sharp vertical forward edge at the radially inner intersection of the two said side wall portions, each radially inner element portion being of height less than the remainder of the respective element so that it is not engaged by the adjacent bottom edge of a coil mounted on the diffuser member;

a support element portion extending over a substantial radius of the diffuser member for engagement with the adjacent bottom edge of a coil mounted on the diffuser member to thereby support the furnace charge thereon and also providing respective side wall portions of the said two adjacent flow paths; and

a radially-outer flow guidance element portion providing respective side wall portions of said two adjacent flow paths and directing the radially-outwards gas flow at an increased inclination to a respective tangent to the coil core and also axially of the coil into the said annular space so as to direct the gas flow in the said helical path.

4,412,816

SLIDING SHOE FOR A PUSHER FURNACE

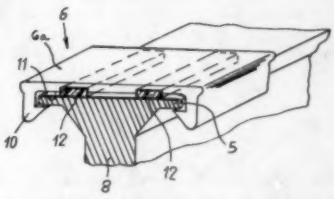
Jules Schlumberger, and Heinrich Aebli, both of Kreuzlingen, Switzerland, assignors to Gautschi Electro-Fours AG, Tägerwilen, Switzerland

Filed Nov. 23, 1981, Ser. No. 324,199

Claims priority, application Switzerland, Jan. 16, 1981, 272/81

Int. Cl.³ F27D *3/00;* **B65G** *19/30*

U.S. Cl. 432—239 **7 Claims**



1. A sliding shoe arrangement for pusher-type furnaces and serving for the sliding transport of objects to be heated in a predetermined feed direction and which are placed upon said sliding shoe, comprising:

rail means;

a sliding shoe cooperating with said rail means and having an at least approximately U-shaped cross-sectional shape and including a web;

said sliding shoe containing downwardly protruding legs disposed laterally of said web and engaging with said rail means in order to provide a laterally guided supporting of said sliding shoe on said rail means of the pusher furnace;

at least one sliding element arranged at an inner side of the web of said sliding shoe; and

said sliding element bearing upon said rail means.

4,412,817

CANOPY KILN SYSTEM

Ronald D. Schmidgall, Mediapolis, Iowa, assignor to Hawkeye Concrete Products Co., Mediapolis, Iowa

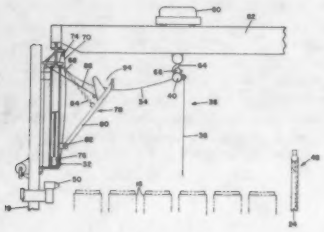
Filed Apr. 16, 1982, Ser. No. 369,062

Int. Cl.³ F27D *1/00;* **F26B** *19/00;* **E04B** *1/12;* **A45B** *9/04*

U.S. Cl. 432—247 **8 Claims**

1. A canopy kiln system comprising generally elongated means for supporting at least one article to be kiln-treated and

having first and second end portions spaced longitudinally apart, first and second support means disposed respectively at and spaced above the first and second end portions at a level above the height of the article, an elongated canopy of flexible material extending generally horizontally between the two support means and having first and second transverse ends respectively adjacent to the first and second support means, means affixing the first end of the canopy to the first support means, transverse stiffener means at the second end of the canopy and affixed thereto, detachable means for connecting the stiffener means and thus the second end of the canopy to



the second support means, overhead track means extending lengthwise of the canopy and between the two support means, a hoist carried by the track means for connection to the stiffener means to raise same and thus the second end of the canopy when the detachable means is detached from the second support means, said hoist being movable on the track means toward the first support means so as to at least partly uncover the article, and lift means connected to an intermediate portion of the canopy and to the first support means at a height above the canopy and operative, as the hoist moves along the track means toward the first support means, to exert a lifting force on the canopy to keep same clear of the top of the article.

4,412,818

METHOD FOR SPLINTING ANIMAL TEETH

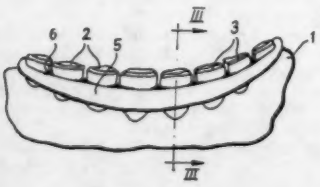
Adam R. Thomson, Edinburgh, Scotland, assignor to Ewesplint Limited, Edinburgh, Scotland

Filed Sep. 22, 1981, Ser. No. 304,628

Claims priority, application United Kingdom, Sep. 25, 1980, 8030938

Int. Cl.³ A61D *5/00*

U.S. Cl. 433—1 **4 Claims**



1. A method of stabilising the teeth of an isolated group of teeth in the jaw of a ruminant which comprises embracing the group with an apertured brace and a layer of a rapidly hardenable bonding composition to leave the incisal edges of the teeth projecting beyond the brace, and allowing the bonding composition to harden and secure the group within the aperture of the brace.

4,412,819

ORTHODONTIC ARCH WIRE

James L. Cannon, Rte. 2, Dahlonega, Ga. 30533

Filed Sep. 15, 1982, Ser. No. 418,259

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—20 **14 Claims**

1. An orthodontic arch wire, comprising a generally U-shaped assembly of an elongated anterior segment, and a pair of spaced-apart elongated posterior segments secured to and extending from respective ends of the anterior segment, the anterior segment being made of a material having a flexural rigidity which is lower than the flexural rigidity of material forming at least one of the posterior segments.

4,412,820

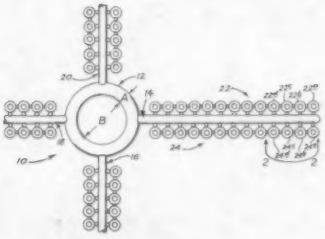
ORTHODONTIC TENSION-APPLYING APPARATUS

Gerald G. Brummond, Canby; Paul E. Klein, Lake Oswego, and Roland M. Anderson, Wilsonville, all of Oreg., assignors to Modcom, Inc., Canby, Oreg.

Filed Apr. 30, 1982, Ser. No. 373,359

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—18 **2 Claims**



1. Interconnected, plural-article, molded, unitary, elastomeric orthodontic apparatus characterized by uniform elasticity resulting from per-article, controlled flow-gating during molding, said apparatus comprising

an elongated dispenser unit,

a plurality of endless chain-loop articles distributed along said unit, with each pair of adjacent loop articles being operatively interconnected by an integral tensioning structure, and

for each article, a flow-gated isthmus severably connecting the article to the unit.

4,412,821

DENTAL MOUTH MIRROR

Jack E. Sturdivant, Oakwood Rd., Rte. #4, Ames, Iowa 50010

Filed Jul. 26, 1982, Ser. No. 401,651

Int. Cl.³ A61B *1/24*

U.S. Cl. 433—30 **6 Claims**

1. A dental mouth mirror, comprising:

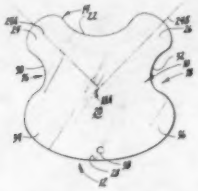
a substantially flat plate means having a mirrored upper surface, opposite side edges, and anterior and posterior edge portions,

a first arcuate indentation in said posterior edge portion, arcuate posterior lobe portions adjacent opposite edges of

said first arcuate indentation, said posterior lobe portions adapted to extend into the open mouth of a dental patient,

said first arcuate indentation having a radius of curvature greater than the radius of curvature of said lobe portions wherein the lateral span of said arcuate indentation is greater than the lateral width of said lobe portions,

said anterior edge portion comprising an outwardly extending arcuate portion,



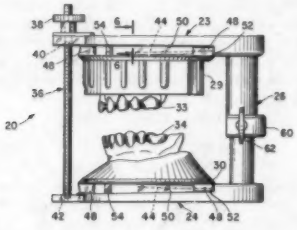
second arcuate indentations in said opposite side edges forming anterior lobe portions with the end of said outwardly extending arcuate portion, said second arcuate indentations being adapted to receive the corners of the mouth of a dental patient to secure the mirror in the open mouth of such patient.

4,412,822

DENTAL ARTICULATOR WITH REMOVABLE TRAY

Charles Blechner, 8 Lighthouse Road, Great Neck, N.Y. 11024

Continuation of Ser. No. 201,821, Oct. 29, 1980, abandoned.
This application Apr. 27, 1982, Ser. No. 372,275
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—60 **14 Claims**



1. A dental articulator comprising:

an upper platform and a lower platform;

means for spacing said upper platform relative to said lower platform including a plurality of legs on which said upper platform can translate relative to said lower platform while maintaining a parallel attitude to said lower platform during a translation of said upper platform relative to said lower platform, and a spacer for holding said upper platform in a selected position relative to said lower platform;

upper and lower trays releasably secured, respectively, to said upper platform and said lower platform;

each of said trays including a longitudinally disposed key;

each of said platforms including a longitudinally disposed keyway for mating with said key;

each of said keyways has side walls which are resiliently supported to the respective ones of said platforms to permit a yielding in the positioning of a tray relative to a platform to facilitate insertion and removal of a tray relative to its platform; and

wherein

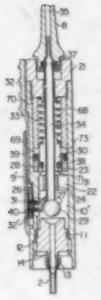
each of said trays includes a set of spaced-apart legs, said legs being brought into contact with the corresponding one of said platforms upon insertion of the key of a tray into the keyway of the corresponding platform to stabilize the orientations of said trays relative to said corresponding platforms.

4,412,823

ORAL CAVITY CLEANER

Hiroaki Sakai, and Tadanori Okazaki, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 10, 1981, Ser. No. 281,926
Claims priority, application Japan, Jul. 21, 1980, 55-100400
Int. Cl.³ A46B *13/06*
U.S. Cl. 433—80 **11 Claims**



1. An oral cavity cleaner comprising:

a pump unit including

a container for storing a fluid; and

a pump coupled to said container for providing said fluid at high pressure;

a flexible conduit; and

a toothbrush unit coupled to said pump unit by means of said flexible conduit, said toothbrush unit including

a toothbrush;

a fluid pressure actuating section operated by the pressure of said high pressure fluid, said fluid pressure actuating section having an actuating member;

a motion transmitting member having a fluid passage therein extending from said fluid pressure actuating section to said toothbrush, said motion transmitting member being driven by said fluid pressure actuating section and transmitting movement to said toothbrush;

a valve section located within said fluid passage and including a valve body driven by the discharge pressure from said pump unit to close said fluid passage, said valve section being brought to an open position when the actuating member of said fluid pressure actuating section has moved an amount exceeding a predetermined value; and

an operating section for opening and closing said valve section, said operating section including a locking member for limiting the movement of said valve body.

4,412,824

REMOVABLE PARTIAL DENTAL PROSTHESIS AND METHOD OF FORMING AND SUPPORTING THE SAME

Leonard J. Kulwiec, 9478 La Cuesta Dr., La Mesa, Calif. 92041, and Michael F. X. Kulwiec, 2791 McBride, Unit No. 105, Santa Rosa, Calif. 95401

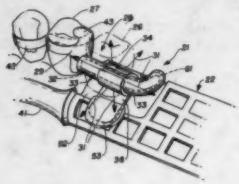
Filed Sep. 18, 1981, Ser. No. 303,560
Int. Cl.³ A61C *13/28*
U.S. Cl. 433—170 **12 Claims**

1. A removable partial dental prosthesis including base means formed to mate with oral mucosa for support of said prosthesis thereon, at least one artificial tooth mounted to said

base means, and connector means formed to resiliently couple said base means to an abutment tooth for limited displacement along three mutually perpendicular axes, wherein the improvement in said dental prosthesis is comprised of:

said connector means is formed with:

(i) an arm mounted to extend away from one of said abutment tooth and said base means,



(ii) connector clip means mounted to a remainder of said abutment tooth and said base means, and

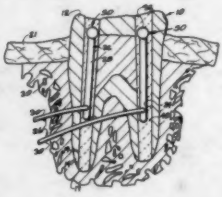
(iii) a resiliently compressible element interposed between said arm and said clip means, said clip means securing said arm to said clip means with said compressible element therebetween.

4,412,825

MEDICAL ENTRY CONNECTOR FOR TEETH BEARING ANIMALS

Richard D. Tokarz, 4188 Laurel Dr., West Richland, Wash. 99352

Filed Sep. 17, 1981, Ser. No. 303,010
Int. Cl.³ A61C 00/00
U.S. Cl. 433—229 30 Claims



15. A permanent subcutaneous body entry communication device for operatively interconnecting an external medical device with a predetermined internal body location of an animal having a tooth with a crown section exposed in a mouth cavity above an attached gingiva and a root section unexposed beneath a free gingiva and supported by a jaw, comprising:

a first communication pathway means implanted in the tooth and extending from the crown section above the attached gingiva to the root section beneath the free gingiva;

interface means operatively connected to the pathway means and mounted to the tooth along the crown section thereof, above the attached gingiva, for connection to an external device; and

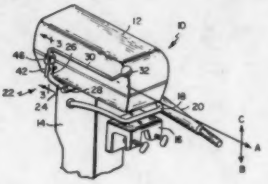
a second communication pathway means implanted in the jaw operatively connected to the first communication pathway means and extending subcutaneously toward the internal body location without intersecting the gingiva to enable the medical device to communicate with the predetermined internal body location.

4,412,826

SAFETY SHIFT DEVICE FOR OUTBOARD MOTORS

William A. Jones, 70 East Ave., Marion, Mass. 02738, and Hugh M. Young, 98 Swanson Ter., Stoughton, Mass. 02072

Filed Sep. 8, 1981, Ser. No. 299,992
Int. Cl.³ B63H 5/13
U.S. Cl. 440—86 1 Claim



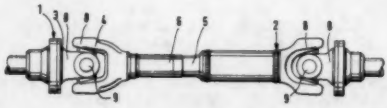
1. A device for actuating the gear shift lever of an outboard motor rotatable about the horizontal axis of a shfat extending laterally from the motor, wherein said gear shift lever has an upstanding vertical arm offset rearwardly of and extending upwardly from the axis of the shaft, comprising an elongate control rod provided at one end with an integral right angular downward extension and its other end with a knob, means for securing said downward extension to the upstanding vertical arm of the gear shift lever in parallel relation thereto so that, in the neutral position of the gear shift lever, the control rod is substantially horizontal and the end provided with a knob extends forwardly from the gear shift lever in an inboard direction beyond the motor and means for fastening said extension to said arm, comprising a pivot pin fixed at one end to the lower end of the extension, a hole in the lower end of the arm through which the pivot pin extends from the outer side through the hole to the inner side, a coil compression spring positioned about the pivot pin between the extension and the arm, a cotter pin fixed to the pivot pin at the inner side of the arm, a collar positioned about the extension and the arm adjacent the upper end of the arm and a set screw fixing the collar to the extension.

4,412,827

UNIVERSAL JOINT

Miloslav Petrzelka, Much-Kranüchel, and Herbert Taureg, Hennef, both of Fed. Rep. of Germany, assignors to Uni-Cardan AG, Siegburg, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 172,362
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933505
Int. Cl.³ F16D 3/26
U.S. Cl. 464—128 10 Claims



1. In a universal joint having trunnion cross means including trunnion means defining a centerline extending centrally therethrough and trunnion cross support means including yoke means defining yoke bore means having inner surface means and bearing bush means having outer surface means received within said inner surface means of the yoke bore means and receiving said trunnion means, the improvement comprising that said trunnion cross support means is formed with conical surface means interfacing between said outer surface means of said bearing bush means and said inner surface means of said yoke bore means, said conical surface means, taken in a direc-

tion outwardly from the center of said universal joint, being formed to extend from radially inwardly to radially outwardly relative to a plane containing said centerline of said trunnion means, said conical surface means operating to define a gap between a part of said outer surface means of said bearing bush means and said inner surface means of said yoke bore means, said gap extending over a part of the spherical area and over a part of the axial length of said inner and outer surface means, said gap being enlarged in relation to the center of said joint from radially inwardly to radially outwardly thereof.

4,412,828

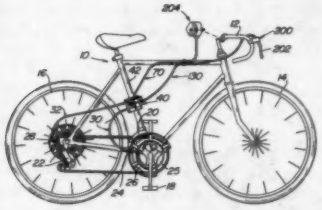
CONTROL MEANS FOR SHIFTING GEARS ON DUAL SHIFT BICYCLES

Jack B. Darby, 302 Bunker Hill Rd., Harleysville, Pa. 19438

Filed May 7, 1981, Ser. No. 261,576

Int. Cl.³ F16H *9/00, 11/00*; B60K *20/00*; G05G *9/00*

U.S. Cl. 474—81 **30 Claims**



1. In a dual shift bicycle having a plurality of drive gears and including a frame, a drive chain, a front sprocket cluster including a plurality of sprockets, a front derailleur associated with the front sprocket cluster and movable to positions for shifting the drive chain into engagement with the sprockets thereof, a rear sprocket cluster including a plurality of sprockets, a rear derailleur associated with said rear sprocket cluster and movable to positions for shifting the drive chain into engagement with the sprockets thereof, a front derailleur shift means operatively connected at one end to the front derailleur and movable for positioning the front derailleur, and rear derailleur shift means operatively connected at one end to the rear derailleur and movable for positioning the rear derailleur, the improvement comprising:

means for shifting between the gears on said dual shift bicycle by moving the front and rear derailleur shift means to position said front and rear derailleurs, including

control means including a front control member operatively engaged with said front derailleur shift means and movable through shifting movements between a plurality of control positions and a rear control member operatively engaged with said rear derailleur shift means and movable through shifting movements between a plurality of control positions,

means for selecting for each of said front and rear control members a selected control position to which said front and rear control members are to be moved in a rear shifting movement from a present control position to a selected control position,

and means operatively engageable with said front and rear control members for actuating the same through said shifting movement with said front and rear control members being positioned together in accordance with two selected control positions of the selecting means when said actuating means is actuated,

said selecting means being operable independently of said actuating means so that the shifting between the gears of said dual shift bicycle is performed in two sequential operations, the first operation being the selection of a desired new gear and the second operation being the actual shifting into said selected gear.

4,412,829

PRODUCTION OF CIGARETTE FILTER UNITS

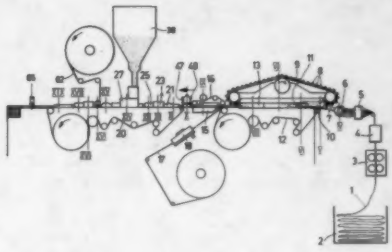
Jean-Pierre Lebet, Montreux, and Michel Berney, Bavois, both of Switzerland, assignors to Baumgartner Papiers, S.A., Crissier, Switzerland

Filed Apr. 2, 1981, Ser. No. 250,390

Claims priority, application Switzerland, Apr. 8, 1980, 2692/80

Int. Cl.³ A24C *5/50*

U.S. Cl. 493—48 **10 Claims**



1. Apparatus for producing a cigarette filter unit, having supply means for supplying a filter rod provided with chambers comprising filling openings which terminate to the outside surface of the filter rod, a filler member for filling the chambers with pourable and/or fibrous filter material, a closing arrangement for closing the filling openings of the chambers filled with pourable and/or fibrous filter material, by means of a closure strip, and having divider means for dividing into defined length sections the filter rod provided with full chambers, characterised in that the filler member which lies slidingly and sealingly on the filter rod and which terminates by at least one filler opening into the chamber filling openings moving past, is provided with at least one first filter material storage chamber which is directly connected to the filler opening, and with at least one second filter material storage chamber which is connected to the first storage chamber by way of a connecting duct which is closable by means of a first closing arrangement, that both filter material storage chambers are constructed as pressure chambers and are connected to controllable supply means for the controlled supply into the interior thereof of a pressure gas subjected to overpressure, that the second storage chamber comprises at least one supply opening closable by means of a second closing arrangement for supplying to this second storage chamber further pourable and/or fibrous filter material when a certain quantity of filter material located therein is too small, and that the first and the second closing arrangement and the supply means for compressed gas are coupled together in such a manner that always only one of the two closing arrangements can be opened, and that upon opening the first closing arrangement a pressure prevails in the second storage chamber which is at least approximately equal to the pressure in the first storage chamber.

4,412,830

COVER FOR CENTRIFUGE ROTOR

David H. Strain, Los Gatos, and John H. Sutton, III, Belmont, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 24, 1982, Ser. No. 391,670

Int. Cl.³ B04B *7/02*

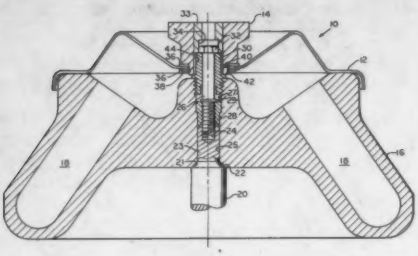
U.S. Cl. 494—12 **6 Claims**

1. A cover for a centrifuge rotor, said rotor having an opening through its center of rotation and being mounted on a drive shaft, said rotor secured to said drive shaft by a threaded fastener at the top of the rotor comprising:

a cover body having an opening through the center;

a knob mounted in the center of said cover body, said knob

captively retained but free to turn with respect to said cover body;



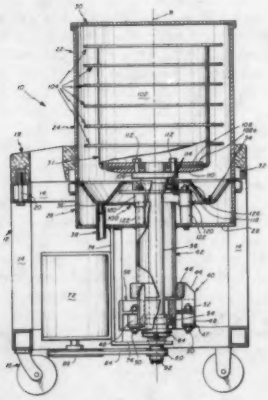
tool means in said knob for rotatably coupling said knob to said threaded fastener, thereby enabling said threaded fastened to be tightened and loosened by turning said knob.

4,412,831

TWO PLANE SELF-BALANCING CENTRIFUGE

Hollon B. Avery, Worcester, and Donald W. Schoendorfer, Brookline, both of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Filed Jul. 9, 1981, Ser. No. 281,648
Int. Cl.[3] B04B 9/00
U.S. Cl. 494—46 15 Claims



1. A centrifuge for processing fluids comprising:
(a) a rotor;
(b) a bearing shaft attached to said rotor and adapted to be driven by a drive means;
(c) first and second bearing members each having a first side rigidly affixed to said bearing shaft and located on said shaft in spaced apart relationship to one another;
(d) first and second spring means being more flexible in one plane than in a plane perpendicular thereto coupled at one point to a second side of the respective first and second bearing members and at another point to a relatively rigid mass means.

4,412,832

PEELABLE CATHETER INTRODUCTION DEVICE

John E. Kling; Larry R. Camin, and Douglas W. Scott, all of Dallas, Tex., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 30, 1981, Ser. No. 259,281
Int. Cl.[3] A61M 25/00
U.S. Cl. 604—164 8 Claims

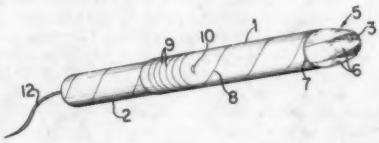
1. An introducer catheter through which an infusion catheter can be inserted into a lumen comprising:
(a) an introducer catheter tube having a proximal end and a distal end;
(b) said introducer catheter tube being provided with score lines along which said catheter may be split apart; and
(c) a slidable sleeve telescopically disposed on the outer surface of said introducer catheter tube, said sleeve being slidable towards the distal end by force exerted upon it through said introducer catheter tube as it is disrupted.

4,412,833

TAMPON APPLICATOR

Georg Wiegner, Viersen, and Elmar Reinwald, Düsseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 319,914
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121364
Int. Cl.[3] A61F 15/00
U.S. Cl. 604—14 4 Claims



1. An applicator system for hygienic introduction of a tampon which comprises a substantially cylindrical outer sleeve, a substantially cylindrical inner sleeve displaceable therein having an outer diameter substantially the same as the inner diameter of the outer sleeve and a flanged end, and a substantially cylindrical tampon, wherein (a) the front end of the outer sleeve is a conically rounded lamellar shutter means consisting of a ring of tulip-shaped, folded, individual lamellae abutting a circumferential groove, the shutter means being normally closed and opening during ejection of the tampon, the circumferential groove acting as a hinge means; (b) the outer sleeve consists of a high-gloss, plastic-coated paper, said paper being coated on the outer surface and said coated paper being readily water degradable or water dispersible; (c) the inner sleeve is comprised of water degradable or water dispersible paper; (d) the inner surface of the outer sleeve and the outer surface of the inner sleeve have co-efficients of friction such that they do not readily slide without applied pressure but on application of slight manual pressure readily slide, thus facilitating the opening of the lamellar shutter means and ejection of the tampon; (e) the outer sleeve has a grip in the form of a scoring; (f) said inner sleeve has substantially the same length as the outer sleeve; and (g) the outer sleeve, inner sleeve, and tampon form with the closed lamellar shutter means at the front end of the tampon a substantially closed system.

4,412,834

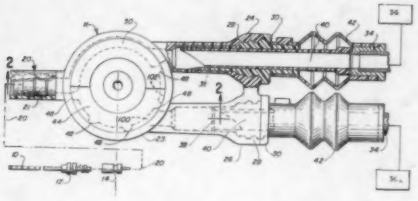
ANTIMICROBIAL ULTRAVIOLET IRRADIATION OF CONNECTOR FOR CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

Ralph Kulin, Marengo, Ill.; Jack W. Moncrief; Robert P. Popovich, both of Austin, Tex., and Ronald C. Stauber, Hawthorne Woods, Ill., assignors to Baxter Travenol Laboratories, Deerfield, Ill., by said Ralph Kulin and Ronald C. Stauber

Filed Jun. 5, 1981, Ser. No. 270,743

Int. Cl.[3] **A61J** *7/00;* **F16L** *35/00*

U.S. Cl. 604—29 **34 Claims**



1. A connector valve for selectively permitting the transfer of fluids therethrough, which comprises multiple-way valve means communicating with a plurality of conduits and selectively permitting and preventing flow between the conduits; said multiple-way valve means comprising outer walls made of substantially ultraviolet-transmissive material; said outer walls of the multiple-way valve means enclosing an elastomeric seal member, said seal member defining rotatable flow channel means for communication with differing conduits at differing rotational positions and providing rotatable seal means against inner surfaces of said outer walls to maintain antimicrobial conditions within said valve, said flow channel means being exposed along its entire length to an inner surface of an outer wall, and means for relatively rotating said seal member relative to said conduits.

4,412,835

STERILE DOCKING PROCESS, APPARATUS AND SYSTEM

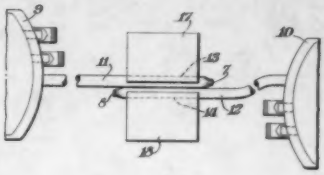
Dudley W. C. Spencer, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jul. 6, 1982, Ser. No. 395,796

Int. Cl.[3] **A61M** *5/00;* **B32B** *31/00*

U.S. Cl. 604—29 **21 Claims**

1. A process of joining first and second thermoplastic tubes together comprising juxtaposing said tubes, forming a molten seal between a surface of a heated elongated body placed substantially perpendicularly to the axes of said tubes and an adjacent side section of each of said tubes thereby providing a seal between the interior and exterior of said tubes and moving the molten side sections of said tubes together while passing



said tubes over an end of said body, thereby forming a joint between said tubes.

4,412,836

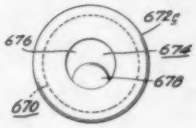
SYRINGE ASSEMBLY

Dominic J. Brignola, Phoenixville, Pa., assignor to The West Company, Incorporated, Phoenixville, Pa.

Division of Ser. No. 34,461, Apr. 27, 1979, Pat. No. 4,331,146, which is a continuation-in-part of Ser. No. 753,954, Dec. 23, 1976, abandoned, which is a continuation of Ser. No. 467,790, May 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 399,729, Sep. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 182,759, Sep. 22, 1971, abandoned. This application Dec. 11, 1981, Ser. No. 329,661

Int. Cl.[3] **A61M** *5/00*

U.S. Cl. 604—87 **1 Claim**



1. A plunger for a syringe made of a resilient material comprising a generally cylindrical body portion, a plurality of radial axially spaced ribs on its outer peripheral, a rupturable diaphragm spaced inwardly from opposite axial ends of the body portion, said diaphragm having a localized weakened area to minimize particle formations when the diaphragm ruptures, and also providing a more accurate control of force required to rupture the diaphragm consisting of a crescent-shaped membrane portion of thinner cross section than the remainder defined by the crescent and the circular trace of the diaphragm.

4,412,837

PROCESS FOR RESIST PRINTING CELLULOSE FIBRES WITH REACTIVE OR DEVELOPING DYES

Adolf Blum, and Hans D. Opitz, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,409

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118193

Int. Cl.[3] **C09D** *11/02;* **D06P** *5/12*

U.S. Cl. 8—449 **11 Claims**

1. In the process for printing textiles made from cellulose fibers or cellulose fibers mixed with other fibers employing reactive and/or developing dyes according to the resist process the improvement wherein 1000 parts by weight of the printing paste contains 10 to 100 parts by weight of a compound selected from the group consisting of:

butylglycol,
butyldiglycol,
butyltriglycol,
1,2-butane diol,
2,5-hexane diol,
diethylene glycol monoethyl ether,

and mixtures thereof.

4,412,838

PROCESS FOR RECOVERING POTASSIUM CHLORIDE

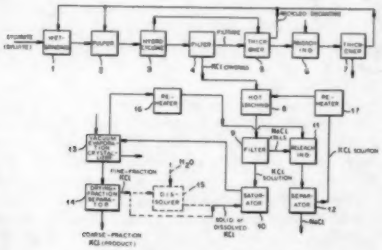
Dietrich Ertl, Königstein, and Dieter Ueberle, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 1,320, Jan. 5, 1979, abandoned. This application Nov. 6, 1980, Ser. No. 204,532

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1978, 2801705

Int. Cl.[3] **B01D** *9/02*

U.S. Cl. 23—302 R **9 Claims**



1. A process for recovering potassium chloride from a starting material consisting predominantly of KCl and NaCl and consisting essentially of the following steps:

(a) finely grinding the starting material;

(b) pulping the finely ground starting material at ambient temperature with a solution which is saturated with sodium chloride and potassium chloride to produce a pulped mass;

(c) classifying the pulped mass formed in step (b) to produce a first phase consisting of the solution and water-insoluble impurities which are mechanically entrained by the solution and a second phase consisting of a moist salt mass which consists substantially of potassium chloride and sodium chloride and from which water-insoluble impurities have been removed to a high degree;

(d) separating the solution from the water-in-soluble impurities of step (c) and recycling the separated solution at least in part to step (b) for pulping the ground starting material therein;

(e) contacting the moist salt mass obtained in step (c) and consisting substantially of potassium chloride and sodium chloride with a solution which comes from a crystallizing stage and which is saturated with sodium chloride and potassium chloride, the contacting being carried out so that a suspension at a temperature of at least 95° C. is obtained;

(f) separating the solution enriched with potassium chloride of step (e) from a solid residue which contains mainly sodium chloride; and

(g) crystallizing the solution obtained in step (f), wherein steps (e), (f) and (g) are carried out in isolation from steps (a), (b) and (c) and the water-insoluble impurities contained therein.

4,412,839

COAL TREATMENT PROCESS

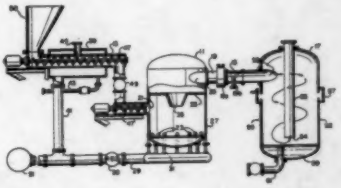
David W. Taylor, Edgemont, Pa., assignor to Ergon, Inc., Jackson, Miss.

Continuation-in-part of Ser. No. 93,870, Nov. 11, 1979, Pat. No. 4,288,231. This application Sep. 4, 1981, Ser. No. 299,648

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.[3] **C10L** *9/00, 9/08;* **B02C** *19/06*

U.S. Cl. 44—1 B **14 Claims**



1. A process for treating coal to reduce the level of ash-forming impurities contained therein comprising:

a. grinding raw coal to a particle size of less than about 40 microns in a substantially air free environment to form a coal-fraction which comprises a major portion of hydrophobic coal particles and a minor portion of hydrophilic coal particles, and an impurities-fraction comprising hydrophilic impurities particles;

b. at least regulating the temperature of the coal at which the grinding step is carried out within the range greater than 220° F. but less than 400° F. to control the amount of said minor portion of hydrophilic coal particles so as to fall substantially below 50% by weight of said raw coal;

c. contacting said fractions with an aqueous liquid whereby said hydrophilic impurities particles and said minor portion of hydrophilic coal particles are wetted, but the hydrophobic coal particles are left substantially dry; and

d. separating said hydrophobic coal particles from said hydrophilic particles.

4,412,840

PELLETIZING LIGNITE

Mehmet A. Goksel, Houghton, Mich. assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Continuation of Ser. No. 82,666, Oct. 9, 1979, abandoned. This application Jan. 16, 1981, Ser. No. 225,491

Int. Cl.[3] **C10L** *5/16, 5/26*

U.S. Cl. 44—10 D **9 Claims**

1. A method for forming high strength pellets from lignite comprising the steps of:

(a) comminuting run of the mine raw lignite into finely divided form without substantial drying;

(b) uniformly blending a sufficient amount of an aqueous base bituminous emulsion with said finely-divided raw lignite to form a moistened mixture containing at least 3 weight % of the bituminous materials, based on the total dry weight of the solids in said mixture;

(c) pelletizing said moistened mixture in a balling means to form discrete, generally spherical, green pellets and having a moisture content of about 25 to about 45 weight %; and

(d) drying said green pellets.

3. A method according to claim 1 wherein said green pellets are dried to a moisture content of no less than about 5 weight % during Step (d).

4,412,841

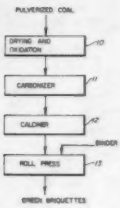
COMPACTED CARBONACEOUS SHAPES AND PROCESS FOR MAKING THE SAME

William Du Broff, Munster; George H. Craig, La Porte, and Timothy A. Veslocki, Highland, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jun. 29, 1981, Ser. No. 278,056

Int. Cl.³ C10B *19/00, 53/08, 57/06;* **C10L** *5/28*

U.S. Cl. 44—10 C **16 Claims**



1. A process for producing compacted carbonaceous shapes comprising the steps of mixing a particulate carbonaceous material with a volatilizable organic binder, said particulate carbonaceous material comprising a calcined char obtained by carbonizing pulverized coal to remove volatile matter and calcining the resultant char, forming the mixture into preformed green shapes, heating said green shapes initially by induction heating at a relatively lower frequency so as to effect substantially uniform heating throughout said shapes, and thereafter heating said shapes by induction heating at a relatively higher frequency sufficient to effect increased heating at the surfaces of said shapes whereby to effect surface graphitization of said shapes.

4,412,842

COAL BENEFICIATION PROCESS

Charles W. Klayer, Louisville, Ky., assignor to Eric Charles Cottell, Bayvill, N.Y.

Continuation of Ser. No. 33,640, Apr. 26, 1979, abandoned, which is a continuation of Ser. No. 888,356, Mar. 20, 1978, abandoned. This application Jan. 9, 1981, Ser. No. 223,612

Int. Cl.³ C10L *9/02, 1/32*

U.S. Cl. 44—1 SR **10 Claims**

1. A method of beneficiating coal which has non-carbonaceous impurities; comprising:

(a) rendering coal to particles of less than 200 microns in diameter;

(b) forming an aqueous slurry consisting of said coal particles of less than 200 microns in diameter and water;

(c) then cavitating said slurry with intense agitation at a level of at least 15 joules/cm^2 to thereby further break the coal particles into smaller particles and to impregnate the particles with water and concentrating said slurry while the slurry is still in a cavitated state to a mixture having up to 40% water to thereby remove a portion of the water and non-carbonaceous impurities from the slurry.

2. The method of claim 1 wherein said cavitation is provided by sonic agitation.

5. The method of claim 1 including pulverizing lime with said coal.

10. A fuel consisting essentially of only coal, oil and water resulting from the steps of: forming a slurry consisting of coal particles and water, cavitating the slurry with intense agitation to break the coal particles into small particles and to impregnate the particles with water and to break off non-carbonaceous impurities from the coal particles, gravitationally separating the coal particles from a major portion of the water and non-carbonaceous impurities while the slurry is in a cavitated state, and slurrying the coal and minor portion of water with oil.

4,412,843

BENEFICIATED COAL, COAL MIXTURES AND PROCESSES FOR THE PRODUCTION THEREOF

Lester E. Burgess; Karl M. Fox, both of Swarthmore, and Phillip E. McGarry, Palmerton, all of Pa., assignors to Gulf & Western Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 114,414, Jan. 22, 1980, Pat. No. 4,304,573. This application May 28, 1981, Ser. No. 267,773

Int. Cl.³ C10M *1/32*

U.S. Cl. 44—51 **22 Claims**

1. A process for beneficiating coal comprising admixing coal in an aqueous medium with a surface treating mixture comprising a polymerizable monomer, a polymerization catalyst and a liquid organic carrier, thereby rendering said coal hydrophobic and oleophilic.

4,412,844

STABLE OIL DISPERSIBLE MAGNESIUM HYDROXIDE SLURRIES

John H. Collins, Bloomingdale; Mei-Jan L. Lin, Naperville, and George T. Kekish, Chicago, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 50,376, Jun. 20, 1979, abandoned. This application Jun. 25, 1981, Ser. No. 277,371

Int. Cl.³ C10M *1/06, 1/10;* **C10L** *1/12*

U.S. Cl. 44—51 **2 Claims**

1. A stable, oil-dispersible, aqueous dispersion of magnesium hydroxide useful as a vanadium corrosion additive for liquid hydrocarbon fuels comprising in percentages by weight:

(a) 20–70% magnesium hydroxide having particle size from 1.0–50 microns;

(b) 29–79% water;

(c) 1.0–8.0% of a water-dispersible, oil-soluble, water-in-oil emulsifying agent having an HLB value of from 4–10;

(d) 0.1–6% of a water-soluble, oil-dispersible emulsifying agent having an HLB of from 20–40, said water-soluble oil-dispersible emulsifying agent being characterized as having a surface active functional group from the group consisting of amide, amine, or ammonium; said dispersion having a Brookfield viscosity of 100–5000 cps utilizing a #3 spindle at 12 rpm at 75° F., said dispersion further being characterized as being readily dispersible into a liquid hydrocarbon fuel.

4,412,845

ETHANOL OR GASOHOL FUEL COMPOSITION CONTAINING AS INHIBITOR A REACTION PRODUCT OF ITACONIC ACID AND MONO-OLEYL-1,3-DIAMINOPROPANE

Benjamin J. Kaufman, and William M. Sweeney, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 16, 1982, Ser. No. 408,324

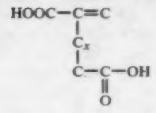
Int. Cl.³ C10L *1/22*

U.S. Cl. 44—53 **26 Claims**

1. A fuel composition for internal combustion engines comprising

(a) a major portion of a fuel containing (i) at least one alcohol selected from the group consisting of ethanol and methanol and (ii) gasoline in amount of 0–50 volumes per volume of alcohol; and

(b) a minor wear-inhibiting amount of, as a wear-inhibiting additive, a reaction product of one mole of the acid



wherein x is an integer 0–2; and two moles of the amine

$$R'NH—R''—NH_2$$

wherein R′ is alkyl, alkenyl, alkaryl, aralkyl, aryl, cycloalkenyl or cycloalkyl and R″ is an alkylene, cycloalkylene, aralkylene, alkarylene, or arylene or polyoxyalkylene.

4,412,846

FUELS CONTAINING N-SUBSTITUTED AMINO MORPHOLINES

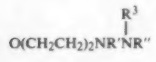
Franklin P. Abbott, Brooklyn, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 32,440, Apr. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 732,612, Oct. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,575, Oct. 31, 1975, Pat. No. 3,989,476, which is a continuation-in-part of Ser. No. 480,764, Jun. 19, 1974, abandoned. This application May 7, 1981, Ser. No. 261,365

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—63 **18 Claims**

1. A fuel composition containing a major amount of a normally liquid fuel and a minor but detergent-producing amount of at least one N-substituted morpholine of the formula



wherein R′ is a divalent organic radical of at least one to about thirty carbon atoms, R^3 is a hydrogen atom or a monovalent hydrocarbyl, hydroxy-substituted hydrocarbyl or hydroxy hydrocarbyleneoxy-substituted hydrocarbyl radical of at least one carbon and R″ is a hydrocarbyl radical of at least about thirty carbon atoms.

4,412,847

MOTOR FUEL ADDITIVE

Serge R. Dolhyj, Parma; Louis J. Velenyi, Lyndhurst, and Andrew T. Guttmann, Maple Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 3, 1978, Ser. No. 948,351

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—77 **15 Claims**

1. A motor fuel comprising a blend of (1) a mixture of hydrocarbons boiling within the gasoline range, and (2) an aryl ether, said aryl ether having the structure:

$$R_1—(R_2)—O—R_3$$

wherein

R_1 is selected from the group consisting of phenyl, substituted phenyl substituted with one methyl group, substituted phenyl substituted with two methyl groups and substituted phenyl substituted with one ethyl group;

R_2 is selected from the group consisting of substituted methane substituted with one or two methyl groups, ethane, and substituted ethane substituted with one or two methyl groups;

R_3 is selected from the group consisting of methyl and ethyl.

4,412,848

HEAT RECOVERY METHOD FROM GASIFIED PRODUCTS OF HYDROCARBON

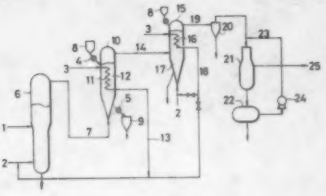
Shuntaro Koyama, Hitachi; Tomohiko Miyamoto, Takahagi; Shinji Tanaka, Hitachi; Hiroshi Miyadera, Hitachi, and Sadao Takahashi, Hitachi, all of Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,270

Claims priority, application Japan, Apr. 28, 1981, 56-63346

Int. Cl.³ C10J *3/46*

U.S. Cl. 48—197 R **2 Claims**



1. A heat recovery method from gasified products of hydrocarbon to recover heat by introducing gas containing oily matters produced by gasifying hydrocarbon and by indirect heat exchange between the said product gas and the cooling agent passing through the heat transfer tube provided in the fluidized bed, in which said gas is passed through the said high temperature fluidized bed kept at about 450°–500° C. and then through the low temperature fluidized bed kept at about 250°–300° C. successively and that the heat of said product gas is recovered by heat exchange in said high temperature fluidized bed and low temperature fluidized bed respectively.

4,412,849

METHOD AND APPARATUS FOR CONTROL OF GAS-BORNE PARTICULATES

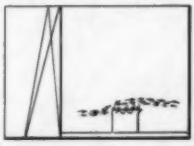
Chandru M. Shahani, Bombay, India, assignor to Klenzaids Engineers Private Limited, Bombay, India

Filed Nov. 20, 1981, Ser. No. 323,571

Claims priority, application United Kingdom, Apr. 9, 1981, 8111175; Apr. 29, 1981, 8113173

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—97 **5 Claims**



1. A method of maintaining the concentration of gas-borne particles in a work space defined by mutually perpendicular X, Y and Z axes to a level of less than 3 particles of 0.5 micron or larger per liter of gas, the plane formed by the X-Y axes being horizontal and impervious and the plane formed by the Y-Z axes being vertical, said method including the steps of

(a) positioning a filter element having a plurality of straight, parallel pleats which have sequentially decreasing depths in the plane formed by the Y-Z axes such that the pleats extend parallel to the Y axis and the depths of the pleats are parallel to the X axis and decrease from pleat to pleat in the direction of the positive Z axis,

(b) causing gas to pass through said filter element so as to provide a plurality of parallel, laminar streamlines of gas to flow in the direction of the positive X axis and parallel to the plane formed by the X-Y axes, the velocities of the

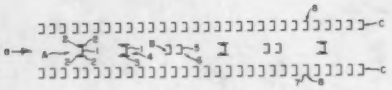
streamlines incrementally decreasing from one streamline to the next in the direction of the positive Z axis.

4,412,850

ELECTRIC DUST COLLECTOR

Tonio Kurata, Yokohama, and Hiroshi Fuji, Machida, both of Japan, assignors to Neat Shujinki Kogyo Kabushiki Kaisha, Yokohama, Japan

Filed Jul. 12, 1982, Ser. No. 397,162
Claims priority, application Japan, Jul. 11, 1981, 56-108515
Int. Cl.³ B03C *3/36, 3/40*
U.S. Cl. 55—130 **1 Claim**



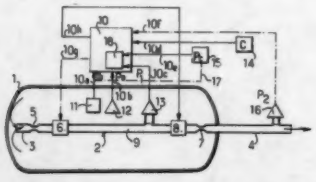
1. An electric dust collector which includes a discharge unit comprising an array of a plurality of discharge electrodes each having a plurality of discharge styluses attached to each inner or outer side of a member of a light gauge steel for general structure to be parallel to a gas flow direction, an oppositely charged particle collecting unit comprising an array of a plurality of members of light gauge steel for general structure as dust collecting electrodes located downstream from said discharge unit in the gas flow direction, said discharge unit and said oppositely charged particle collecting unit being alternately arranged to constitute a discharge electrode side, a dust collecting unit consisting of an array of members of light gauge steel for general structure as dust collecting electrodes arranged at predetermined intervals at each side of said discharge electrode side, lines normal to and depending from pointed ends of said discharge electrodes substantially coinciding with central lines of side surfaces of said dust collecting electrodes of said dust collecting unit.

4,412,851

CRYOGENIC APPARATUS SUITABLE FOR OPERATIONS IN ZERO GRAVITY

Robert Laine, NL Wassenaar, France, assignor to Agence Spatiale Europeene, Paris, France

Filed Feb. 10, 1982, Ser. No. 347,651
Claims priority, application France, Mar. 2, 1981, 81 04086
Int. Cl.³ B01D *19/00;* F17C *7/02*
U.S. Cl. 55—160 **20 Claims**



1. Cryogenic apparatus of the open cycle kind comprising a reservoir for storing a cryogenic fluid in liquid-vapour phase equilibrium, and a phase separator comprising an inlet for receiving fluid from within said reservoir and an outlet for liberating fluid outside, said inlet including inlet obturator means for closing and opening said inlet, characterized in that said phase separator comprises a transfer chamber disposed within said reservoir between said inlet and said outlet, said inlet presenting a constriction and said outlet including outlet obturator means for closing and opening said outlet, and control means for alternately closing and opening said obturator means in sequence, whereby to admit fluid from said reservoir into said transfer chamber, and subsequently to liberate said fluid from said transfer chamber.

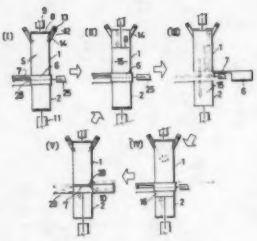
11. Cryogenic apparatus of the open cycle kind comprising a reservoir for storing a cryogenic fluid in liquid-vapour phase equilibrium, and a phase separator comprising an inlet for receiving mixed phase fluid from within said reservoir and an outlet for liberating fluid outside, said inlet including inlet obturator means for closing and opening said inlet, characterized in that said phase separator is disposed within said reservoir and comprises a transfer chamber between said inlet and said outlet, said inlet presenting a constriction and said outlet including outlet obturator means for closing and opening said outlet, and control means for alternatively closing and opening said inlet and outlet obturator means in sequence, whereby to admit fluid from said reservoir into said transfer chamber, to allow liquid in said transfer chamber to evaporate at a pressure intermediate between the reservoir pressure and the outlet pressure, and subsequently to liberate said fluid from said transfer chamber.

4,412,852

APPARATUS FOR PRODUCING BRICK-SHAPED BLOCKS OF DRY ICE

Naotake Umino, 1962-3 OOno, Ichikawashi, Chibaken, and Tatsuo Fukuda, 5-23-405 Takesato Danchi, 6-118 Ooaza Ooeda, Asukabeshi, Saitamaken, both of Japan

Filed Dec. 14, 1981, Ser. No. 330,497
Int. Cl.³ F25J *1/00*
U.S. Cl. 62—35 **12 Claims**



1. An apparatus for producing blocks of dry ice from liquid carbon dioxide, comprising:

a supporting frame;

an upper, charging mold mounted on said supporting frame and having an outlet at the lower end thereof;

a lower, press mold mounted on said supporting frame beneath said charging mold and spaced therefrom, said press mold having an inlet opening at the upper end thereof in alignment with said outlet opening;

a press piston slidably mounted within said press mold;

actuator means connected with said press piston, and operable to move it between lowered and elevated positions;

nozzle means mounted near the upper end of said charging mold, and arranged to inject liquid carbon dioxide into said charging mold to form dry ice snow;

transfer means mounted to confront the space between said upper and said lower molds; and

shutter means carried by said supporting frame and received in the space between said upper and said lower molds, said shutter means including:

a shutter having an extension projecting forwardly from the front, top edge thereof, the top surfaces of said shutter and said extension being continuous, and said extension and the front face of said shutter defining a recess that is open at the bottom and front thereof; and

actuator means arranged to move said shutter forwardly and backwardly between a fully closed position, wherein said shutter closes both said outlet and said inlet, an outlet

closed position, wherein said charging mold outlet is closed by said extension and said recess is positioned over said press mold inlet, and a fully open position wherein both said inlet and said outlet are open and in communication with each other,

whereby dry ice snow is accumulated in said charging mold while said shutter is in said fully closed and said outlet closed positions, and is passed as a charge into said lower, press chamber when said shutter is in said fully open position;

said press piston and said press actuator means being effective to compress said dry ice snow charge into a block of dry ice when said shutter is in said fully closed position, and being further effective to elevate said block of dry ice and place it in said recess when said shutter is in said outlet closed position; and

said shutter and said shutter actuator means being effective to transport said dry ice block to said transfer means when said shutter is thereafter moved from said outlet closed position to said fully closed position.

4,412,853

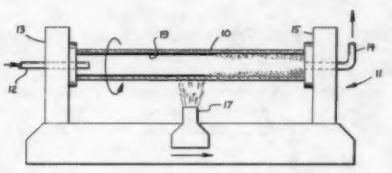
METHOD OF MAKING OPTICAL WAVEGUIDE FIBER PREFORM STARTER TUBES

Fred P. Partus, Marietta, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,158

Int. Cl.³ C03B *23/08, 37/025*

U.S. Cl. 65—3.12 **1 Claim**



1. A method of making an optical waveguide fiber preform starter tube having a tube wall of preselected cross-sectional area comprising the steps of extruding or free-drawing a glass tube having a tube wall cross-sectional area less than said preselected area; measuring the wall cross-sectional area of the glass tube; and fusing successive layers of glass having a composition different from that of the glass tube but an index of refraction substantially equal to that of the glass tube onto the interior surface of the tube by vapor deposition until the tube wall cross-sectional area is substantially equal to said preselected area.

4,412,854

METHOD OF PRODUCING FIBER REINFORCED GLASS MATRIX COMPOSITE ARTICLES OF COMPLEX SHAPE

George K. Layden, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 25, 1982, Ser. No. 381,803

Int. Cl.³ B32B *5/00;* **C03C** *27/00;* **C03B** *23/20*

U.S. Cl. 65—18.1 **3 Claims**

1. A method of making fiber reinforced glass composite articles that is particularly adapted to making such articles in complex shapes, comprising applying a layer of carrier liquid containing glass powder and a thermoplastic polymeric binder to a sheet of woven or non-woven high temperature stable fiber reinforcement, cutting a plurality of preforms of predetermined patterns from such sheets, stacking a plurality of the treated preforms on top of each other on a mold surface, warm molding the stacked preforms to form an intermediate article of definite predetermined shape, heating the formed article to decompose and remove the fugitive binder, hot pressing the

thus treated article to form a composite article of high strength.

4,412,855

2-CHLORO-N-(2'-METHOXYPROPYL)- AND 2-CHLORO-N-(2'-ETHOXYPROPYL)-2'',6''-DIMETHYL-ACETANILIDE AS LONG TERM WEED KILLERS

Christian Vogel, Binningen, and Rudolf Aebi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

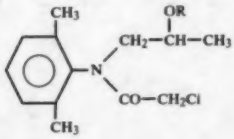
Continuation-in-part of Ser. No. 860,016, Dec. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 688,867, May 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 548,041, Feb. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 328,202, Jan. 31, 1973, abandoned. This application Sep. 22, 1978, Ser. No. 944,816

Claims priority, application Switzerland, Feb. 7, 1972, 1739/72; May 16, 1972, 7283/72

Int. Cl.³ A01N *37/22;* **C07C** *103/32*

U.S. Cl. 71—118 **4 Claims**

1. A compound of the formula I



(I)

wherein R represents methyl or ethyl.

4,412,856

HERBICIDAL HETEROCYCLIC AND SUBSTITUTED PHENYL PHENYLACETYLENE AMINES

Hans-Georg Brunner, Lausen; Rolf Schurter, Binningen, and Henry Szczepanski, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

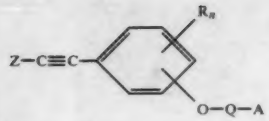
Filed May 22, 1981, Ser. No. 266,264

Claims priority, application Switzerland, May 31, 1980, 4232/80

Int. Cl.³ A01N *33/10, 43/08, 43/10, 43/54, 43/66, 43/78;* **C07C** *93/06*

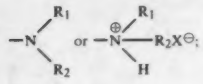
U.S. Cl. 71—121 **19 Claims**

1. A phenylacetylene compound of the formula



wherein

A is an amino group of the formula



each of R_1 and R_2 is hydrogen; C_3–C_6alkenyl; C_3–C_6alkynyl; C_3–C_8cycloalkyl; or C_1–C_6alkyl optionally substituted by halogen, hydroxy, C_1–C_4alkoxy, alkoxycarbonyl containing at most 5 carbon atoms, cyano or carboxyl; or, together with the nitrogen atom to which they are attached, R_1 and R_2 form a 5- or 6-membered saturated heterocyclic ring system containing altogether at most 2 hetero-atoms and which is optionally substituted by C_1–C_3alkyl;

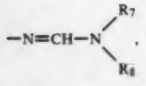
$X^{\ominus}$ is an anion;

R is hydrogen; nitro; cyano; trifluoromethyl; C_1–C_4 alkoxy; C_1–C_4alkylthio; —NR_5R_6; CO—NR_7R_8; —$COOR_9$; —CO—SR_{10}; halogen; —N_3; or C_1–C_4alkyl optionally substituted by C_1–C_4alkyl, hydroxy, cyano or —$COOR_9$; each of R_5, R_7, R_8, R_9 and R_{10} is hydrogen; C_1–C_6alkyl; C_3–C_8alkenyl; or C_3–C_8alkynyl;

R_6 is hydrogen; C_1–C_6alkyl; C_3–C_8alkenyl; C_3–C_8alkynyl; —CO—R_{11}; —$COOR_{12}$; or —CO—NHR_{13}; in which R_{11}, R_{12} and R_{13} have the same meanings as R_4;

n is an integer from 1 to 4; and

Z is heterocyclic radical selected from the group consisting of furanyl, thienyl, pyridyl, pyrimidinyl, thiazolyl and triazinyl, each of which is optionally substituted by one or more radicals having the same meaning as R, formyl, —SO_2—NR_7R_8, —NH—NH_2, —NHOH, —SO—R_9, SO_2—R_9,



$COO^{\ominus}M^{\oplus}$ in which $M^{\oplus}$ is a sodium, potassium, calcium or magnesium cation, or C_2–C_6alkenyl which optionally substituted by nitro, cyano or —$COOR_9$.

13. 1-[4-(4-Methoxyphenylethynyl)phenoxy]-2-diethylaminoethane.

14. 1-[4-(4-Fluorophenylethynyl)phenoxy]-2-diethylaminoethane.

16. A herbicidal composition comprising a herbicidally effective amount of at least one compound according to claim **1**, **13** or **14**, together with a suitable carrier therefor.

17. A method of controlling weeds, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim **1**, **13** or **14**.

4,412,857

METHOD OF SMELTING FERRONICKEL IN ORE-SMELTING ELECTRICAL FURNACE UNDER A LAYER OF CHARGE

Vladimir A. Kadykov; Boris P. Onischin, both of Leningrad; Gennady P. Ermakov, Orsk; Valery D. Linev, Leningrad; Viktor P. Khristoforov, Orenburgskaya; Alexandr E. Burochkin; Sergei G. Mittsev, both of Kirovogradskaya; Gennady A. Timofeev, Orenburgskaya; Viktor R. Keller, Kirovogradskaya; Viktor P. Mikshin, and Grigory I. Grodinsky, both of Leningrad, all of U.S.S.R., assignors to Gosudarstvenny Proektny I Nauchno-Issledovatelsky Institut "Gipronikel", Leningrad, U.S.S.R.

Filed Apr. 27, 1982, Ser. No. 372,306

Int. Cl.[3] **C22D** *7/04;* **C21C** *5/52*

U.S. Cl. 75—11 **12 Claims**

1. A method of smelting ferronickel in an ore-smelting electrical furnace under a layer of charge, comprising the steps of:

supplying charge into the electrical furnace at it is melted down to maintain the height of the charge layer at a required level,

discharging a slag as said charge is melted down to maintain the depth of a slag bath in the range of from 0.6 to 1.1 of the electrode diameter,

tapping ferronickel as a ferronickel bath is increased, and

adjusting the depth of immersion of the electrodes into said slag bath and the specific power at the electrode surfaces wetted with said slag so as to provide conditions ensuring the possibility of maintaining such a temperature of said ferronickel bath that is adequately high for the free ferronickel tapping.

4,412,858

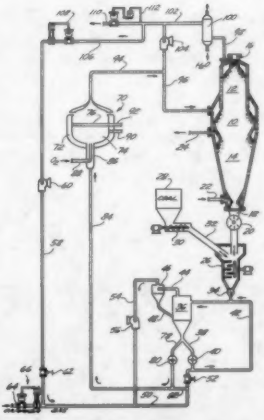
METHOD OF CONVERTING IRON ORE INTO MOLTEN IRON

Ricardo Viramontes-Brown, Garza Garcia, and Jorge B. Castanon, San Nicolas de los Garza, both of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Jul. 12, 1982, Ser. No. 397,222

Int. Cl.[3] **C21B** *13/06*

U.S. Cl. 75—38 **8 Claims**



1. A method for producing molten iron from iron ore which comprises supplying said ore in lump or pellet form to a vertical shaft, moving bed reduction reactor, passing a hot reducing gas upwardly through said moving bed to reduce said ore to sponge iron, establishing a bath of molten iron in a melter-gasifier, preparing a finely ground mixture of coal and said sponge iron, feeding the ground mixture to said molten bath, feeding elemental oxygen to said bath to react with the coal of

said mixture to maintain said bath molten and to produce a reducing gas, utilizing at least a part of the reducing gas thus produced as the reducing gas passed through said moving bed of ore and withdrawing molten iron from said melter-gasifier.

4,412,859

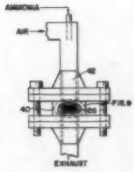
METHOD FOR RECOVERING PLATINUM IN A NITRIC ACID PLANT

W. Robert Hatfield, Westfield; Ronald M. Heck, Frenchtown, and Thomas H. Hsiung, Piscataway, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 292,113, Aug. 12, 1981, and Ser. No. 292,114, Aug. 12, 1981. This application Aug. 2, 1982, Ser. No. 403,996

Int. Cl.³ C22B *11/00*; B22F *3/00*

U.S. Cl. 75—83 **16 Claims**



1. A method for the recovery of platinum and/or rhodium lost from a platinum-containing catalyst during ammonia oxidation processes at temperatures above 850° C.; which comprises bringing said lost platinum and/or rhodium into contact with a foraminate element fabricated from material consisting essentially of palladium characterized by (a) a novel configuration whereby the initial product of mesh size (N) and wire diameter (d_w) for said element is greater than at least about 0.3 and (b) where, for a given nitrogen throughput, the weight recovery efficiency (η') is a function of the wire diameter (d_w) and mesh size (N) combination and weight recovery efficiency is improved by increasing mesh size (N) for a given wire diameter or increasing the wire diameter (d_w) for a given mesh size.

4,412,860

PROCESS FOR RECOVERING NIOBIUM FROM URANIUM-NIOBIUM ALLOYS

Steven A. Wallace, Knoxville; Edward T. Creech, and Walter G. Northcutt, both of Oak Ridge, all of Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 425,141

Int. Cl.³ C22B *34/24*

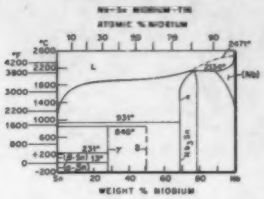
U.S. Cl. 75—84 **5 Claims**

1. A method of separating niobium from a uranium-niobium alloy, comprising the steps of:

melting tin and a uranium-niobium alloy to disperse the tin in the alloy;

solidifying the melted tin and uranim-niobium alloy to form a billet;

heating said billet to combine niobium with tin therein; and contacting said billet with hydrochloric acid to dissolve uranium in the billet in the acid and leave an insoluble



material selected from the group consisting of $Nb_6Sn_2H_2$ and Nb_6Sn_2.

4,412,861

METHOD FOR THE RECOVERY OF URANIUM VALUES FROM URANIUM TETRAFLUORIDE

Alvin B. Kreuzmann, Cincinnati, Ohio, assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 27, 1982, Ser. No. 437,082

Int. Cl.³ C22B *60/02*

U.S. Cl. 75—84.1 R **12 Claims**

10. A method for the recovery of uranium from uranium tetrafluoride, comprising:

providing an intimate mixture of particulate uranium tetrafluoride and an alkaline earth metal oxide selected from the group consisting of calcium oxide and magnesium oxide,

heating said mixture in the presence of oxygen to form the corresponding alkaline earth metal uranium and alkaline earth metal fluoride,

treating the resulting mixture of said uranate and metal fluoride with an acidic solution to effect dissolution of said uranate, and

recovering uranium from the resulting solution of said uranate.

4,412,862

METHOD FOR THE PRODUCTION OF FERROCHROMIUM

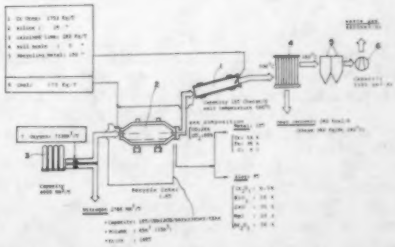
Tsuneo Miyashita; Tsutomu Fukushima; Kiyoshi Kawasaki, and Sadayuki Sasaki, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1982, Ser. No. 399,974

Claims priority, application Japan, Jul. 21, 1981, 56-112936

Int. Cl.³ C22C *33/00*

U.S. Cl. 75—130.5 **7 Claims**



1. A method for the production of ferrochromium comprising

(1) preheating or prereducing a mixture comprising chromium ores, fluxes, and a carbonaceous reducing agent in a

first furnace, said first furnace selected from a rotary kiln, a shaft furnace or a fluidized bed,

(2) discharging said preheated or prereduced mixture from (1) into a second furnace, said second furnace comprising a rotary furnace having its axis positioned horizontal, or at an angle no greater than 35 degrees to horizontal,

(3) smelting and reducing the mixture of said second furnace by blowing oxygen or oxygen-enriched air into said second furnace, and

(4) tapping out the molten metal ferrochrome, the method further characterized in that the exhaust gases from (3) are utilized as the heat source for (1).

4,412,863

INORGANIC CEMENT COMPOSITIONS HAVING CONTROLLED THERMAL EXPANSION COEFFICIENTS

James E. Neely, Jr., Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1981, Ser. No. 299,359
Int. Cl.³ C04B *19/04*
U.S. Cl. 106—84 **16 Claims**

1. In an organic silicate cement composition including a water soluble silicate and an inorganic curing agent which combine and cure to form a cement having a coefficient of thermal expansion, the improvement comprising:

an inorganic filler material of fused silica in an amount to provide a selected coefficient of thermal expansion in the cured inorganic silicate cement composition which is less than said coefficient of thermal expansion of said cement matrix,

wherein the cured inorganic cement composition comprises by weight about 5 to 70 percent silicate, about 1 to 15 percent curing agent, and about 20 to 90 percent fused silica.

4,412,864

ASPHALT COMPOSITIONS AND A VIBRATION-DAMPING SHEET FORMED BY THE SAME

Tomozo Kurashige, and Hidetoshi Shimada, both of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1981, Ser. No. 253,044
Int. Cl.³ C08L *93/00*
U.S. Cl. 106—235 **17 Claims**

1. An asphalt composition comprising

(A) 100 parts by weight of asphalt;

(B) 0.1 to 20 parts by weight of a diene liquid rubber having at least one carboxyl group, epoxy group or amino group in the molecule; and

(C) 2 to 350 parts by weight of (i) an asbestos fibrous filler having a fiber length of 1 mm or less.

4,412,865

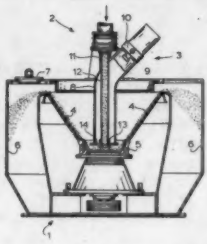
DEVICE FOR SEPARATING A FILLER MASS

Heinrich Schmidt, Düsseldorf, Fed. Rep. of Germany, assignor to Hein, Lehmann AG, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 216,214
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951666
Int. Cl.³ C13F *1/06*; H05B *6/78*
U.S. Cl. 127—19 **11 Claims**

1. In a device for separating a sugar-containing filler mass into a solid and a liquid component of the type including a continuously operating centrifuge, a dosaging device for feeding the filler mass to the centrifuge, and a device for heating the filler mass immediately before being fed to the centrifuge, the improvement comprising:

said device for heating said filler mass comprising a microwave heater including a substantially straight pipe piece serving as a wave conductor, and a filler feed pipe which



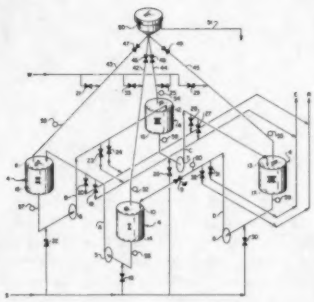
is coaxially coupled to said pipe piece for discharging the filler into said pipe piece.

4,412,866

METHOD AND APPARATUS FOR THE SORPTION AND SEPARATION OF DISSOLVED CONSTITUENTS

Karlheinz W. R. Schoenrock, Ogden, Utah; Michael M. Kearney, and D. Eugene Rearick, both of Twin Falls, Id., assignors to The Amalgamated Sugar Company, Ogden, Utah

Filed May 26, 1981, Ser. No. 267,065
Int. Cl.³ C13K *3/00*; C13D *3/14*
U.S. Cl. 127—46.2 **15 Claims**



1. A simulated moving bed process for recovering a separated component from a feed solution containing said separated component and a non-separated component, comprising:

providing a bed of separating medium for said separated component divided into four zones, each including at least one discrete vessel, containing a portion of said bed with an inlet at one end of said portion and an outlet at the opposite end of said portion, said zones being serially designated I, II, III and IV, respectively, and arranged in a loop for series flow by connection of the outlet of each zone to the inlet of the next succeeding zone of the series, the outlet of zone IV being connected to the inlet of zone I;

filling the zones with liquid so that the entire bed is immersed and substantially free from entrapped gas;

circulating liquid through the entire bed in a circulation loop through said zones with pump means located within said loop, and while maintaining said circulation,

introducing feed solution to zone II, thereby displacing a raffinate fraction from said zone for recovery from said bed and creating a front of non-separated component which migrates with the circulation flow through zone IV; and approximately simultaneously

introducing eluant to zone I, thereby displacing an extract fraction from said zone for recovery from said bed;

continuing said introductions to and withdrawals from zones III and I until said front of non-separated component migrates to approximately a first reference location in the loop, with respect to the outlet of zone IV; and then

introducing feed solution to zone IV, thereby displacing a raffinate fraction from said zone IV for recovery from said bed; and approximately simultaneously

introducing eluant to zone II, thereby displacing an extract fraction from said zone II for recovery from said bed;

continuing said introductions to and withdrawals from zones IV and II until said front of non-separated component migrates to approximately a second reference location in the loop with respect to the outlet of zone I; and then

introducing feed solution to zone I, thereby displacing a raffinate fraction from said zone I for recovery from said bed; and approximately simultaneously

introducing eluant to zone III, thereby displacing an extract fraction from said zone III for recovery from said bed;

continuing said introductions to and withdrawals from zones I and III until said front of non-separated component migrates to approximately a third reference location in the loop with respect to the outlet of zone II; and then

introducing feed solution to zone II, thereby displacing a raffinate fraction from said zone II for recovery from said bed; and approximately simultaneously

introducing eluant to zone IV, thereby displacing an extract fraction from said zone IV for recovery from said bed;

continuing said introductions to and withdrawals from zones II and IV until said front of non-separated component migrates to approximately a fourth reference location in the loop with respect to the outlet of zone III; and thereafter

repeating the aforedescribed sequence of introductions of feed solution and eluant, respectively, and corresponding withdrawals of raffinate and extract, respectively, in coordination with the migration of said front through the loop to the proximities of said first, second, third and fourth reference locations.

2. A process according to claim 1 wherein the feed solution is an invert sugar solution, the separated component is fructose, the non-separated component comprises the remaining constituents of the inverted sugar solution, and the eluant is water.

4,412,867

WET MILLING OF STARCH BEARING MATERIALS WITH WATER RECYCLE AFTER REVERSE OSMOSIS OR ULTRAFILTRATION

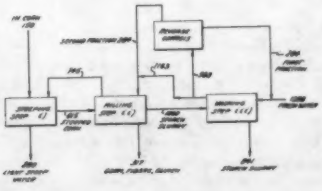
Amelio Cicuttini, Sterrebeek, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 245,558, Mar. 19, 1981, abandoned. This application Aug. 5, 1982, Ser. No. 405,491

Claims priority, application United Kingdom, Mar. 26, 1980, 8010226; Jan. 20, 1981, 8101643

Int. Cl.³ C13L *1/00, 1/02*

U.S. Cl. 127—66 **14 Claims**



1. A process for recovering a starch slurry from a starch bearing material by the sequential steps of:

(i) forming an aqueous slurry of a comminuted starch bearing material,

(ii) separating a starch rich fraction from said slurry, and

(iii) washing said starch rich fraction in at least one stage to purify it,

wherein the improvement comprises introducing fresh water at step (iii) and using water that has been used in step (iii) for step (i) and step (ii), wherein at least part of the water that is used in the process but has not yet exited therefrom is separated by reverse osmosis or ultrafiltration into first and second fractions of which the first fraction has lower contents of both soluble matter and insoluble matter than the second fraction, said first fraction being recycled and combined with the fresh water to increase the purity of the starch in step (iii).

4,412,868

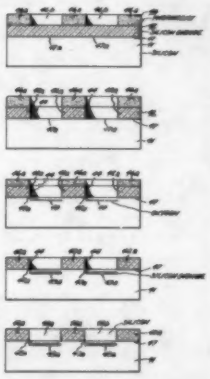
METHOD OF MAKING INTEGRATED CIRCUITS UTILIZING ION IMPLANTATION AND SELECTIVE EPITAXIAL GROWTH

Dale M. Brown, and Kirby G. Vosburgh, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1981, Ser. No. 333,596

Int. Cl.³ H01L *21/20, 21/265, 21/76*

U.S. Cl. 148—1.5 **5 Claims**



1. A method of making an integrated circuit comprising:

providing a substrate of silicon semiconductor material,

forming an insulating layer overlying a major surface of said substrate,

forming a plurality of apertures in said insulating layer which expose a plurality of selected portions of said major surface of said substrate,

implanting ions of oxygen in said substrate at a predetermined depth under each of said selected portions of said major surface of said substrate,

annealing said substrate to repair the damage to the crytalline structure of the regions of said substrate adjacent said selected portions of said major surface caused by implanting said activators therein,

said ions of oxygen being implanted in said substrate in a sufficiently high concentration and the annealing of said substrate being carried out at a temperature and for a time to convert said concentration of ions into a layer of silicon dioxide underlying each of said selected portions of said major surface of said substrate,

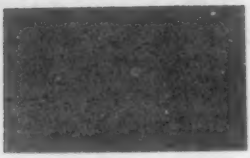
growing epitaxially a layer of silicon on each of said selected portions of said major surface of said substrate.

4,412,869

ALUMINUM ALLOY TUBE PRODUCT AND METHOD

William D. Vernam; Ralph W. Rogers, Jr., and Harry C. Stumpf, all of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 23, 1980, Ser. No. 219,572
Int. Cl.[3] C22F *1/04*
U.S. Cl. 148—2 15 Claims



1. A method of producing aluminum tube product characterized by a substantially uniform distribution of relatively fine, generally equiaxed constituents comprised mainly of elemental silicon, comprising the steps of:

(a) providing in billet form a body of aluminum base alloy consisting essentially of 2 to 13 wt.% Si, 0 to 4 wt.% Zn, 0.005 to 0.5 wt.% Sr, up to 1 wt.% Fe and up to 1 wt.% Cu, the balance essentially aluminum and incidental impurities;

(b) extruding said billet into a thick-walled tube member;

(c) drawing said tube member into thin-walled tube stock for use as tubes in a heat exchanger assembly.

4,412,870

WROUGHT ALUMINUM BASE ALLOY PRODUCTS HAVING REFINED INTERMETALLIC PHASES AND METHOD

William D. Vernam; Ralph W. Rogers, Jr., and Harry C. Stumpf, all of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 23, 1980, Ser. No. 219,573
Int. Cl.[3] C22F *1/04*; C22C *21/06*
U.S. Cl. 148—2 74 Claims

1. A wrought aluminum alloy product, the alloy consisting essentially of 0.5 to 10 wt.% Mg, about 0.2 to 1.6 wt.% Mn, 0 to 0.35 wt.% Cr, 0.005 to wt.% Sr, 0.04 to 1 wt.% Fe, 1 wt.% max. Si, 3.5 wt.% max. Zn, 1 wt.% max. Cu, 0.3 wt.% max. Ti, the remainder aluminum and incidental impurities, the product being characterized by the presence of at least one intermetallic phase of the type containing Al-Fe-Si, Al-Fe-Mn and Al-Fe-Mn-Si, wherein at least one of such phases is refined.

49. A method of producing an aluminum alloy flat rolled product, the method comprising the steps of:

(a) providing a body of an aluminum base alloy consisting essentially of 0.5 to 10 wt.% Mg, about 0.2 to 1.6 wt.% Mn, 0 to 0.35 wt.% Cr, 0.005 to 0.5 wt.% Sr, 0.04 to 1 wt.% Fe, 1 wt.% max. Si, 3.5 wt.% max. Zn, 1 wt.% max. Cu, the remainder aluminum and incidental impurities,

(b) heating the body to a temperature of not greater than 1100° F., and

(c) hot rolling said body to produce a flat rolled product being characterized by the presence of at least one intermetallic phase of the type containing Al-Fe-Si, Al-Fe-Mn and Al-Fe-Mn-Si, wherein at least one of such phases is refined.

4,412,871

CAST COPPER ALLOYS

Prakash D. Parikh, Hamden; Louis P. Stone, Naugatuck; Eugene Shapiro, Hamden, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 146,833, May 5, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,212
Int. Cl.[3] C22C *9/02*; C22F *1/08*
U.S. Cl. 148—2 5 Claims

1. A method for processing a copper base alloy consisting essentially of from 1 to 6% silicon, from 0.2 to 5% tin and the balance essentially copper, said method providing a cast structure of said alloy having good hot workability, said method comprising:

direct chill casting ingots of said alloy;

said direct chill casting step comprising: providing a water cooled mold; transferring said alloy in molten form into said mold; forming an ingot shell by solidification due to heat transfer within said mold; and directly impinging water onto said ingot as it emerges from said mold, the improvement wherein, said step of transferring said molten alloy into said mold comprises:

transferring said molten alloy at a melt temperature entering said mold of from 150° C. to 250° C. in excess of the liquidus temperature of said alloy, to provide said alloy which is resistant to edge-cracking during hot working and which comprises a first external inversely segregated surface zone, a second internal bulk ingot zone, and a subsurface denuded zone bridging said first and second zones and exhibiting a uniform coarse grain structure which is devoid of second phases.

4,412,872

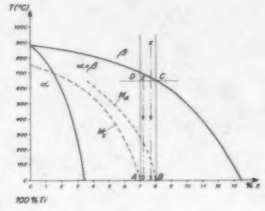
PROCESS FOR MANUFACTURING A COMPONENT FROM A TITANIUM ALLOY, AS WELL AS A COMPONENT AND THE USE THEREOF

Joachim Albrecht, Deutscher; Thomas Duerig, Nussbaumen, and Dag Richter, Carouge, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Mar. 19, 1982, Ser. No. 359,858
Claims priority, application Switzerland, Mar. 23, 1981, 1934/81
Int. Cl.[3] C22C *34/10*
U.S. Cl. 148—11.5 F 21 Claims

1. A process for manufacturing a component from a titanium alloy, which, in the stable starting condition, contains at least some of the body-centered phase at room temperature, in which process the components are mixed, melted and cast, and the workpiece obtained in this manner is hot-worked and subjected to a solution-annealing treatment in the temperature region in which at least some of the stable β-phase exists, and is subsequently quenched to room temperature, after which it is subjected to a mechanical working operation and a further heat treatment, wherein the alloy belongs, in its metallurgical composition, to the class of the mechanically unstable β-

titanium alloys, which are defined by the fact that at least some of their cubic body-centered β-phase can, by applying a permanent deformation, be transformed into the stress-induced martensitic α''-phase, and wherein the workpiece is quenched to a temperature at which the β-phase is mechanically unstable, at a rate which is sufficiently high to retain the mechanically unstable β-phase and to suppress the formation of any new phase, except for the athermal ω-phase and except for a maximum of 10% by volume of martensite, which is thermally



induced by quenching, from the temperature region above the β-transformation or above a temperature which is sufficiently high to cause at least some of a β-phase to form, which, in its turn, is unstable, and wherein the mechanical working operation comprises the application of tension, pressure, shear, or a combination of two or more of these operations, in the temperature range in which the β-phase is mechanically unstable and is carried out in a manner such that a permanent deformation of up to a maximum of 7% is produced, and wherein the further heat treatment at least comprises a heating operation.

4,412,873

SINTERED METAL ARTICLES AND THEIR MANUFACTURE

John W. Hone, and Terence M. Cadle, both of Coventry, England, assignors to Brico Engineering Limited, Coventry, England

Filed Nov. 12, 1981, Ser. No. 320,428

Claims priority, application United Kingdom, Nov. 19, 1980, 8037172

Int. Cl.³ C21D *1/48*

U.S. Cl. 148—16.5 **14 Claims**

1. A method of manufacturing sintered metal articles infiltrated with a selected metal comprising the steps of:

taking a sintered metal skeleton,

selecting a metal which has a lower melting point than the metal of the skeleton and which, when melted, will infiltrate the skeleton,

electro-plating the lower melting point metal onto at least a part of the sintered metal skeleton, and then

heating the plated skeleton to a temperature greater than the melting point of the plated metal whereby the plated metal is caused to infiltrate the sintered metal skeleton, whereby to produce a sintered metal article in which the skeleton is infiltrated by the selected metal to increase the strength of the article.

4,412,874

SILANE BALLISTIC MODIFIER CONTAINING PROPELLANT

Chester W. Huskins, and Leroy J. Williams, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 19, 1981, Ser. No. 322,821

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.2 **6 Claims**

1. A solid propellant composition employing a silicon compound as a burning rate catalyst, said solid propellant composition consisting essentially of said silicon compound, a hydroxyl terminated polybutadiene binder, ultrafine ammonium perchlorate of about 1 micrometer particle size, ammonium perchlorate of about 90 micrometers particle size, aluminum metal powder fuel, a curing agent of isophorone diisocyanate, an optional quick cure catalyst of triphenyl bismuthine, and an optional bonding agent which is the reaction product of equimolar quantities of 12-hydroxystearic acid and tris[1-(2-methylaziridinyl)]phosphine oxide, said silicon compound selected from the group of silicon compounds consisting of p-bis(dimethylsilyl)benzene, tris(dimethylsilyl)amine, triethylsilane, hexamethyldisilane, bis(dimethylamino)dimethylsilane, bis(dimethylamino)methylsilane, octylsilane, hexamethylcyclotrisilazane, and dimethyldiicyanatosilane.

4,412,875

NITRAMINE COMPOSITE PROPELLANT COMPOSTION

Kunio Hasegawa, Aichi, and Michinori Takizuka, Handa, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,770

Claims priority, application Japan, Oct. 7, 1980, 55-139348

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.9 **6 Claims**

1. A nitramine composite propellant containing a polybutadiene binder and a nitramine oxidizer as the main constituent thereof, wherein said polybutadiene binder comprises 100 parts by weight of a carboxyl-terminated polybutadiene or a hydroxyl-terminated polybutadiene, from 0.5 to 10 parts by weight of a polybutadiene having terminal maleic anhydride groups and from 0.5 to 10 parts by weight of an alkanolamine or a mixture of two or more alkanolamines.

4,412,876

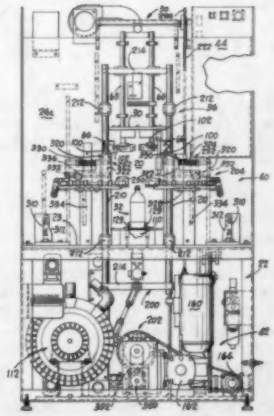
LABELING APPARATUS

Bernard Lerner, Peninsula, and Dana J. Liebhart, Streetsboro, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Filed Jul. 7, 1981, Ser. No. 281,281

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—64 **29 Claims**



1. A process of labeling containers comprising:

(a) bringing a plurality of containers into abutment in a row along a path;

(b) positioning one of the containers in the row at a labeling station;

(c) establishing a pressure differential on the one container with a stationary support at the labelling station;

(d) applying a label to the one container by sliding a sleeve over the one container;

(e) pushing the row of containers along the path and thereby removing the one container from the station and positioning another container at the station;

(f) applying a sleeve to said another container after it has been positioned at the station and a pressure differential has been applied to it.

4,412,877

EMBOSSING SECONDARY BACKINGS OF CARPETS

William G. Vosburgh, West Chester, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 251,987, Apr. 6, 1981, abandoned. This application Apr. 21, 1982, Ser. No. 370,394

Int. Cl.³ A46D 1/00; B32B 5/00

U.S. Cl. 156—72 4 Claims

1. In a tufted-carpet process wherein a primary backing is tufted, back-sized and then laminated to a bonded, nonwoven fabric, secondary backing to form a carpet composite, the improvement comprising embossing the secondary backing after it has become an integral part of the carpet composite at a temperature and under a load such that an embossed pattern is formed in the secondary backing and the force required to stretch the carpet composite one-half percent is decreased to less than 70 percent of the force required prior to the embossing step.

4,412,878

METHOD OF JOINING TOGETHER OPTICAL FIBRE UNDERSEA CABLES

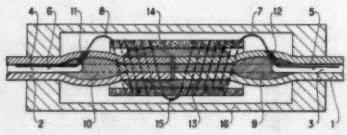
Lucien Guazzo, Calais, France, assignor to Societe Anonyme dite: Les Cables de Lyon, France

Filed Apr. 6, 1982, Ser. No. 366,020

Claims priority, application France, Apr. 8, 1981, 81 07057

Int. Cl.³ B32B 7/04; G02B 5/14

U.S. Cl. 156—91 5 Claims



1. A method of joining together two lengths of optical fibre undersea cable, each length having a core in which at least one optical fibre is disposed, said core being surrounded by a carrier vault formed by metal strands, said method comprising the steps of:

cutting off a given length of said carrier vault at each cable end to free suitable lengths of said optical fibres,

inserting each optical fibre free length into a part with the free length passing through an opening within the side of said part and positioning said part within the center of the carrier vault inwardly from the end thereof and passing the fibre free length protruding from the opening within the side of said part outwardly between the strands of the carrier vault,

bringing the ends of said carrier vaults together and fixing them substantially in contact each with another while placing a first sleeve about the contacting ends of said carrier vaults,

interconnecting the free ends of said optical fibres,

tensioning the free ends of the optical fibres from each of said cable ends, and

then helically winding the excess length of said fibres around said first sleeve.

2. A method according to claim 1, wherein the step of fixing said cable ends together comprises disposing a second, metal sleeve about the ends of said carrier vaults internally of said first sleeve.

4,412,879

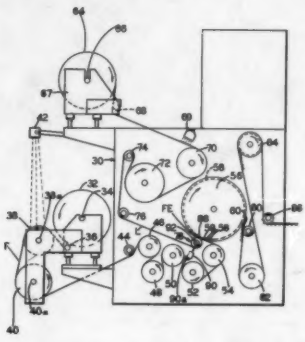
CUSHIONING DUNNAGE APPARATUS AND METHOD

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Filed Nov. 2, 1981, Ser. No. 317,505

Int. Cl.³ B32B 31/12, 3/28

U.S. Cl. 156—145 30 Claims



1. In an energy efficient method of manufacturing air cell cushioning material from a plurality of flexible thermoplastic film with each film comprising a composite of a stratum of high density high melting point thermoplastic material generally impervious to the passage of gas therethrough and at least one other stratum bonded to the first mentioned stratum, with the second mentioned stratum being formed of a low density low melting point thermoplastic, the last mentioned thermoplastic being of a lower density, lower melting point thermoplastic as compared to that of said first mentioned stratum, comprising the steps of heating a first of the composite films to a heated temperature above the melting point temperature of the second mentioned stratum but below the melting point temperature of the first mentioned stratum and to a temperature adequate for permitting thermoforming of said first film, embossing said heated first film by feeding it onto a rotating forming drum maintained at a predetermined temperature range and having a plurality of recesses therein, and forming from the first composite film the air cells in the recesses on said forming drum by vacuum, with said other stratum of said first film facing outwardly of the drum, heating a second composite film of the thermoplastic to a heated temperature below the melting point of said second mentioned stratum of said second film and to a maximum temperature approximating the mean temperature between the heat softening point and the Vicat softening point of said second mentioned stratum, applying said second film with said other stratum thereof facing said first film to said first film with associated pressure, while said first film is at about said heated temperature thereof, whereby the heat in said first film causes a softening of the confronting other stratum of the second film sufficiently in conjunction with said pressure to cause a bonding of said first and second films at the areas of engagement while on the drum so as to seal the air cells in the product, and then cooling the formed air cell product on the rotating drum to a temperature which is below said softening point of said other stratum so as to set the bond between said films.

18. In an energy efficient apparatus for producing embossed air cell cushioning material from a plurality of flexible thermoplastic film stock, each film of which comprises a composite of a stratum of high density high melting point thermoplastic material generally impervious to the passage of gas therethrough and at least one other stratum bonded to the first

mentioned stratum, with the second mentioned stratum being formed of a low density low melting point thermoplastic, the last mentioned thermoplastic being of a lower density, lower melting point thermoplastic as compared to that of said first mentioned stratum, said apparatus comprising, a rotatably driven forming drum having a plurality of recesses therein for vacuum forming the air cells in a first film of thermoplastic material fed onto the rotating drum, and a series of rollers at least certain of which are driven, spaced with respect to said forming drum, said series of rollers including means providing for heating a first film prior to its being fed onto said drum to a temperature above the melting point temperature of the second mentioned stratum of the film but below the melting point temperature of the first mentioned stratum and to a temperature adequate for permitting thermoforming of the first film, and a second series of rollers at least certain of which are driven, spaced from said first roller series and having means thereon capable of heating a second film of the thermoplastic stock material to a temperature which is below the melting point of the second mentioned stratum of the second film and to a maximum temperature approximating the mean temperature between the heat softening point and the Vicat softening point of said second mentioned stratum, and movable heated pressure means coacting with said first and said second series of rollers for pressurized application of the second film to the first film on said drum resulting in a bonding of the second film to the first film and sealing of the formed air cells, said pressure means being disposed closely adjacent to the terminal one of said first series of rollers and closely adjacent the point of application for the first film to the drum.

4,412,880

PROCESS FOR PRODUCING HOLLOW PROFILED STRUCTURES, AND STRUCTURES PRODUCED THEREBY

Erich Wintermantel, 10 Elsa-Brandstromstrasse, 5300 Bonn-Bad Godesberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 695,960, Jun. 14, 1976, Pat. No. 4,132,577. This application Oct. 18, 1978, Ser. No. 952,454

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1975, 2529185

Int. Cl.³ B29C *17/06, 17/07*

U.S. Cl. 156—156 **2 Claims**

1. A method of making a hard multi-tubular structure which comprises: producing a flat hose fabric composed of a plurality of side-by-side abutting hoses, introducing uninflated foil tubes into each of the hoses of the fabric, the tubes being of substantially the same length as the length of the fabric, treating the fabric with a hardening material, inflating the tubes for expanding the hoses into formed hollow sections, allowing hardening of the hardening material and setting of the fabric with the hoses in expanded condition, and leaving the tubes after setting of the hose fabric in the respective hollow sections free of any internal inflating pressure, the hose fabric being woven with weft threads and warp threads being in groups with spacings present between adjacent pairs of groups.

2. A method of making a hard multi-tubular structure which comprises: producing a flat hose fabric composed of a plurality of side-by-side abutting hoses, introducing uninflated foil tubes into each of the hoses of the fabric, the tubes being of substantially the same length as the length of the fabric, treating the fabric with a hardening material, inflating the tubes for expanding the hoses into formed hollow sections, allowing hardening of the hardening material and setting of the fabric with the hoses in expanded condition, and leaving the tubes after setting of the hose fabric in the respective hollow sections free of any internal inflating pressure, the weft threads and warp threads of the hose fabric being interwoven in a displacement-proof manner at their points of intersection.

4,412,881

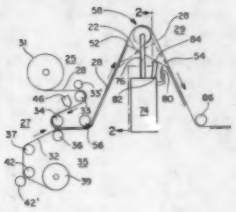
METHOD AND APPARATUS FOR MANUFACTURING ELASTIC LEG DISPOSABLE DIAPERS

Wayne C. Sigl, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 29, 1981, Ser. No. 278,619

Int. Cl.³ B32B *31/08*

U.S. Cl. 156—164 **16 Claims**



1. In an apparatus for manufacturing elastic leg disposable diapers including means for continuously moving a web of material in the direction of its length and means for attaching portions of a continuously moving elastic ribbon to the web at predetermined spaced apart locations along the length of the web, said predetermined locations corresponding to the leg areas of the finished diapers, the combination comprising:

means acting in the web for separating the path of movement of the web and the elastic ribbon between said attached locations; and

means for removing the unattached portions of the elastic ribbon between said attached locations while the unattached portions are separated from the web whereby the elastic ribbon will have an elasticization affect on the web only along said attached locations corresponding to the leg areas of the finished diapers.

4,412,882

METHOD FOR PRODUCING COMPOSITE PIPES

Hisao Morimoto, Nagaokakyo; Toshimi Inai, Kyoto, and Takashi Shimizu, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 175,043, Aug. 4, 1980, abandoned, which is a continuation of Ser. No. 3,943, Jan. 16, 1979, abandoned. This application Feb. 17, 1982, Ser. No. 349,665

Claims priority, application Japan, Jan. 20, 1978, 53-5557

Int. Cl.³ B65H *81/00;* **B65C** *3/12;* **B05C** *3/02;* **B29F** *3/10*

U.S. Cl. 156—188 **5 Claims**

1. A method of producing a composite pipe which comprises:

rotating a cylindrical mold around its cylindrical axis and moving said mold axially while rotating it;

feeding a reinforcing material containing a binder to the mold for wrapping it spirally around the mold to form an inside surface layer;

providing a thickness regulating roller at a position at a predetermined distance from the surface of said inside layer corresponding to the desired thickness of the pipe;

maintaining said thickness regulating roller at said position by a contacting roller having a rotating shaft coaxial or parallel with the axis of rotation of said thickness regulating roller and fixed to the supporting structure for said thickness regulating roller by contacting the periphery of said contacting roller with said inside surface layer;

feeding a molding material containing a binder between said rotating and axially moving mold and said thickness regulating roller in an amount sufficient to maintain a supply of molding material in the converging space between said mold and said thickness regulating roller upstream of the narrowest space between the mold surface and the surface

of the thickness regulating roller, said converging space containing said supply of molding material having a dimension tangential to said thickness regulating roller equal to a substantial part of the radius of said thickness regulating roller for forming an intermediate layer having the desired thickness around the mold;

wrapping a reinforcing material containing a binder about the intermediate layer; and

hardening the resulting structure.

4,412,883

VERY THICK SHAPED LAMINATED PLASTIC

Tiziano Rizó, Parma, Italy, assignor to Salvarani S.p.A., Italy

Filed Jul. 28, 1981, Ser. No. 287,634

Claims priority, application Italy, Aug. 8, 1980, 24066 A/80

Int. Cl.[3] **B29C** *19/00;* **C09J** *5/02;* **B28B** *9/00*

U.S. Cl. 156—222 **8 Claims**

1. A process for the production of a very thick, shaped, plastic laminate from sheets of Kraft paper weighing between 120 and 200 g/sq.m. imbued with phenolic resin, comprising

forming a pack of at least thirty parallel dimensionally equal superposed Kraft papers imbued with phenolin resin,

laying said pack onto a first part of a mold, shaped with bending lines of from 5–14 mm parallel to a main axis of said mold, and

closing said mold according to a diagram of pressures which comprises at least a first closing and preheating phase, said mold being held at a constant temperature while the temperature of the pack of Kraft papers rises up to the temperature of polymerization of the resins whereby said resin is softened but polymerization has not yet started, the pressure in said first closing and preheating phase being kept at a rate below 8 kg/sq.cm., and a second processing phase at a substantially constant temperature with thereafter polymerizing a clamping pressure increasing from 8 kg/sq. cm. up to 100 kg/sq. cm.

4,412,884

ADHESIVE BONDING METHOD EMPLOYING DIENE BIS-IMIDE POLYMERS

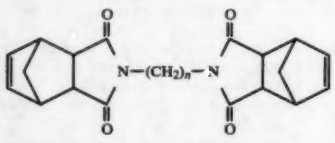
Daniel A. Scola, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 273,139, Jun. 12, 1981, Pat. No. 4,354,012. This application Apr. 5, 1982, Ser. No. 365,744

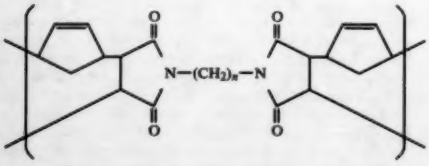
Int. Cl.[3] **C09J** *5/02*

U.S. Cl. 156—307.3 **3 Claims**

1. A method of adhesion bonding two or more surfaces together comprising applying to at least one surface a moisture resistant polyimide adhesive formed by polymerizing monomers of the formula:



to form a polymer with repeating units



where n is about 8 to about 20, and the polymer has a room temperature water immersion moisture absorption rate less than about 0.6% by weight for 24 hours and a tensile lap shear strength greater than about 1800 psi (1.24×10^7 NT/M^2), such properties imparted to the polymer with curing for less than about one hour, followed by placing the two surfaces together with the adhesive in-between and curing for less than about one hour at about 250° C. to about 320° C.

4,412,885

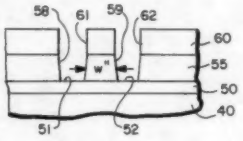
MATERIALS AND METHODS FOR PLASMA ETCHING OF ALUMINUM AND ALUMINUM ALLOYS

David N. Wang, Cupertino; Frank D. Egitto, Santa Clara, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Nov. 3, 1982, Ser. No. 438,786

Int. Cl.[3] **C23F** *1/02*

U.S. Cl. 156—643 **17 Claims**



1. In a method for etching a layer of electrically conductive material formed on a semiconductor wafer and comprising aluminum as the principal element, the steps of:

disposing said wafer on one of a pair of electrode structures in a closed chamber;

communicating into said chamber a reactive gas mixture comprising a principal gas mixture of BCl_3 and Cl_2 doped with a small amount of dopant gas mixture of O_2 and a fluorocarbon gas; and

supplying radio frequency electrical energy to one of said electrode structures to create a plasma of said reactive gas mixture for etching said electrically conductive material.

4,412,886

METHOD FOR THE PREPARATION OF A FERROELECTRIC SUBSTRATE PLATE

Susumu Sakaguchi, Annaka; Kenichi Taguchi, Joetsu; Masaaki Iguchi, and Kunihiro Ito, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,823

Claims priority, application Japan, Apr. 8, 1982, 57-58533

Int. Cl.[3] **B44C** *1/22;* **C03C** *15/00, 25/06;* **H01L** *21/306*

U.S. Cl. 156—645 **5 Claims**

1. A method for the preparation of a substrate plate of a single-crystalline ferroelectric material which comprises the steps of:

(a) slilcing a single crystal boule of the ferroelectric material into wafers;

(b) lapping the wafer on both surfaces to impart an adequate roughness;

(c) subjecting the thus lapped surfaces of the wafer to chemical etching to remove the strain produced in the steps of slicing and lapping; and

(d) subjecting one and only one of the surfaces to mirror-polishing.

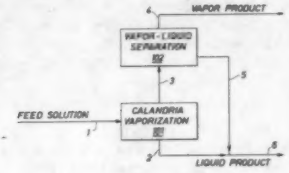
4,412,887
EVAPORATION PROCESS WITH LIQUID ENTRAINMENT SEPARATION

Robert F. Dye, Sugarland, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 23,796, Mar. 26, 1979, abandoned. This application Feb. 1, 1980, Ser. No. 113,141

Int. Cl.³ B01D 1/14

U.S. Cl. 159—47.1 **11 Claims**



1. An improved evaporation method for the separation of a liquid feed solution consisting essentially of volatile solvent and non-volatile solute components having a relative volatility of at least 1000 to 1 into a vapor product containing a major portion of the volatile solvent and a minor portion of the non-volatile solute, said minor portion of non-volatile present in the vapor product essentially only in entrained liquid droplets, and a liquid product containing a minor portion of the volatile solvent and a major portion of the non-volatile solute, which comprises

(a) heating in a calandria a liquid solution consisting essentially of a volatile solvent and the non-volatile solute to produce a calandria vapor stream containing solvent vapor and entrained liquid droplets and a calandria bottoms liquid stream which is the liquid product, said calandria vapor stream containing non-volatile solute essentially only in the entrained droplets;

(b) contacting, in countercurrent flow in a contact zone containing as a contact media packing or one or more trays, the liquid feed solution with the calandria vapor stream to yield a contact zone overhead vapor stream containing solvent vapor and entrained liquid droplets and a contact zone bottoms liquid, said liquid droplets entrained in the contact zone overhead vapor having a lower concentration of non-volatile solute than the droplets entrained in the calandria vapor, and said contact zone overhead vapor comprising a lesser total quantity of non-volatile than does the calandria vapor;

(c) separating, in a vapor-liquid separation means, the greater part of the entrained liquid from the contact zone overhead vapor to produce the vapor product and a recovered liquid entrainment stream;

(d) introducing both the contact zone bottoms liquid stream from (b) and the recovered liquid entrainment stream from (c) into the calandria as the liquid solution to be heated according to (a).

4,412,888
WOOD PULP FIBER PROCESS AND RESULTANT PRODUCTS

Henry A. Fremont, Wyoming, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 145,981, May 2, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 338,009

Int. Cl.³ D21C 9/00

U.S. Cl. 162—54 **4 Claims**

1. The process of making a wood pulp fiber product selected from a wood pulp fiber or a wood pulp fiber web having a lower specific volume for a given surface area than coventionally prepared cellulosic wood pulp fibers or webs comprising utilizing a fiber or a web made from a fiber hydrated to a freeness of about 0 to 650 CSF, freezing the wood pulp fiber while in the form of an aqueous slurry or web having a fiber solids content of about 3 to 60 percent solids by weight to a fiber temperature of at least −5° C. or below, and thawing the aqueous slurry or web,

said freezing and thawing occuring without the presence of chemicals reacting with the wood pulp fibers.

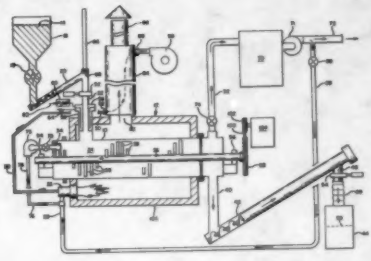
4,412,889
PYROLYSIS REACTION APPARATUS

Robert C. Oeck, Portland, Oreg., assignor to Kleenair Products Co., Inc., Clackamas, Oreg.

Filed Mar. 22, 1982, Ser. No. 360,574

Int. Cl.³ C10B 1/06, 43/06, 43/14

U.S. Cl. 202—117 **10 Claims**



1. Pyrolysis reaction apparatus, comprising:

a pyrolysis reaction chamber for the pyrolytic decomposition of material by heat in the absence of oxygen;

furnace means including a furnace wall surrounding the reaction chamber, for applying heat to said reaction chamber;

input means for feeding the material to be treated into said reaction chamber while excluding the entry of oxygen containing gas, downward through an inlet conduit extending substantially vertical through the furnace wall along an input feed path to an inlet region within the reaction chamber where the temperature is above the vaporization temperature of said material;

cooling means for cooling the inlet conduit to prevent said material from melting within said inlet conduit sufficiently to cause clogging, said cooling means including a cooling jacket surrounding said inlet conduit and means for flowing cooling fluid through said jacket;

impeller conveyor means rotating about an axis of rotation for conveying said material through said reaction chamber along its longitudinal axis to cause said material to decompose, said input feed path being horizontally spaced from said axis of rotation; and

output means for transmitting the residue of the decomposition of said material from said reaction chamber while excluding the entry of oxygen containing gas, through at least one output conduit.

4,412,890
COKE OVEN BATTERY FOR PRODUCTION OF COKE AND GAS

Heinz Thubeauville, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Jan. 18, 1982, Ser. No. 340,005

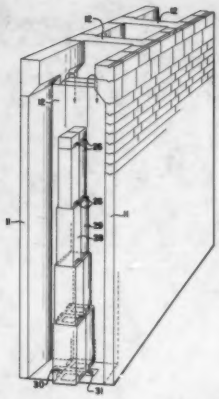
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111476

Int. Cl.³ C10B 21/06, 21/12

U.S. Cl. 202—139 **6 Claims**

1. In a coke oven battery for the production of coke and gas, said coke oven battery having chambers with heating flues extending vertically between said chambers, regenerators below said chambers connected to said heating flues, midfeath-

ers separating said heating flues from one another in the space between adjacent pairs of chambers, a plurality of hollow shaft members within said heating flues for conducting preheated gaseous combustion-supporting agents from said regenerators, said shaft members having a rectangular cross section which decreases upwardly in a stepwise fashion for correspondingly



decreasing the flow of said agents while correspondingly increasing the flow space for burning of gases therein, said shaft members including first and second pairs of opposed walls extending respectively, parallel and perpendicular to the longitudinal axis of a heating flue, said first pair of walls extending into recesses in said midfeathers, and a plurality of exit orifices within said first pair of walls of said shaft members.

4,412,891

COKE OVEN DOOR HAVING PROFILED SEALING DIAPHRAGM

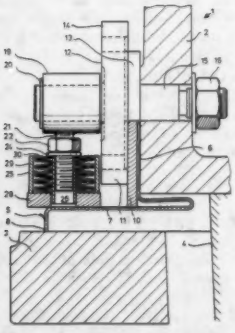
Werner Abendroth, Haltern, Fed. Rep. of Germany, assignor to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,584

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131157

Int. Co.³ C10B *25/06, 25/16*

U.S. Cl. 202—248 **11 Claims**



1. A coke oven door assembly engageable in a coke oven frame, comprising a door body, a stopper connected to said door body and spaced from an edge of said door body, a sealing diaphragm having a clamp leg portion disposed over a portion of said door body edge and a free leg portion extending substantially at right angles to the clamp leg portion, said free leg portion having an end part adapted to bear in sealing engagement with the frame and substantially parallel to said clamp portion, said sealing diaphragm including a loop formation between said clamp leg portion and said free leg portion having a first part extending toward said stopper from said clamp portion and a second part extending toward said end part to said free leg portion, said first and second parts extending in the space between said door body edge and stopper, an adjusting element overlying at least a portion of said clamp leg portion, a clamp assembly mounted on said door body and clamping said adjusting element over said free leg portion, spring indicating means carried by said clamp assembly including a fixed part and a movable part bearing against said free leg portion, and spring means biasing said movable part into engagement with said free leg portion.

4,412,892

PRETREATMENT OF SUPERALLOYS AND STAINLESS STEELS FOR ELECTROPLATING

Edward S. Chen, Clifton Park, and William Baldauf, Altamont, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 13, 1981, Ser. No. 282,909

Int. Cl.³ C25D *5/34*

U.S. Cl. 204—34 **8 Claims**

1. A process for electroplating a metal on a substrate of superalloy, which comprises activating the substrate surface by anodic etching in an aqueous solution consisting essentially of about from 55% to 80% by volume of 95-98% sulfuric acid and about from 1 to 10% by volume of 52% hydrofluoric acid at a current density of at least 20 A/dm^2, and electroplating the activated surface with a metal of the group consisting of chromium, nickel, cobalt, copper and iron.

4,412,893

ANODE-ASSISTED CATION REDUCTION

Derek J. Fray, Trumpington; John P. Chilton, and Arthur V. Cooke, both of Cambridge, all of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 244,772, Mar. 17, 1981. This application Feb. 8, 1983, Ser. No. 464,867

Claims priority, application United Kingdom, Mar. 17, 1980, 8008953

Int. Cl.³ C23F *1/04;* C23C *1/06, 1/10, 1/08*

U.S. Cl. 204—105 R **11 Claims**

1. A method of reduction of cations more noble than iron by anode-assisted electrolysis comprising electrolyzing cations at a cathode of a cell in which the anolyte contains ferrous ion as a reducing agent, the electrolysis conducted while the anolyte is agitated or the anode is moved with respect to the anolyte thereby providing relative motion between the anode and the anolyte such as to promote contact of the anode with ferrous ion despite their mutual electrostatic repulsion, while at the same time maintaining a static relationship between the cathode and the catholyte, and the anolyte is in free communication with the catholyte

wherein the concentration of the ferrous ion is from 0.5 to 10 g/l and the anode is of platinum, graphite, platinized titanium, platinized titanium including therein platinum oxide, titanium coated with iridium oxide, or iridium oxide on a platinum support.

4,412,894

PROCESS FOR ELECTROWINNING OF MASSIVE ZINC WITH HYDROGEN ANODES

Walter Juda, Lexington; Robert J. Allen, Saugus, and Amiram Bar-Ilan, Newtonville, all of Mass., assignors to Prototech Company, Newton, Mass.

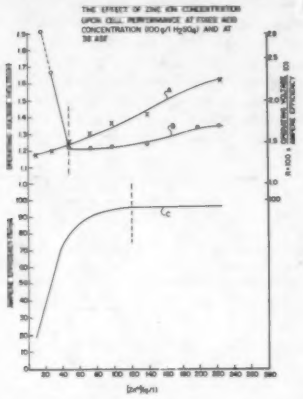
Filed Jul. 6, 1981, Ser. No. 280,795

Int. Cl.³ C25C *1/16*

U.S. Cl. 204—119 **4 Claims**

1. A process for electrowinning massive zinc at a tempera-

ture between about ambient and about 75° C. and at a cathodic ampere efficiency in excess of about 85% in a driven single-compartment cell comprising a zinc cathode electrode and a spaced porous hydrophobic hydrogen anode electrode, the process comprising the steps of providing said cell with a common electrolyte contacting both said electrodes, said electrolyte being a purified aqueous solution of zinc sulfate and free sulfuric acid, said solution being doped with an organic additive capable of sustaining the ampere efficiency throughout the electrolysis; adjusting said solution to contain a sufficient concentration of zinc, as zinc sulfate, to enable cathodic deposition



of zinc at said ampere efficiency, and to contain free sulfuric acid in amount within a concentration range that enables attainment of the voltage benefit of the anodic hydrogen gas-hydrogen ion reaction without adversely affecting said cathodic ampere efficiency; passing an electrolysis current through said cell; supplying hydrogen gas to said anode in amount sufficient to prevent anodic oxygen evolution during said electrolysis; and maintaining said zinc and free acid concentrations during said electrolysis, said concentration of zinc being maintained between about 50 g/l and about 200 g/l and said concentration range of free sulfuric acid being between about 80 g/l and about 300 g/l.

4,412,895

SYSTEM USING SO_2 AS AN ANODE DEPOLARIZER IN A SOLID OXIDE ELECTROLYTE ELECTROLYSIS CELL FOR H_2 PRODUCTION FROM STEAM

Wen-Tong P. Lu, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1981, Ser. No. 307,137
Int. Cl.³ C25B *1/02*
U.S. Cl. 204—129 **8 Claims**

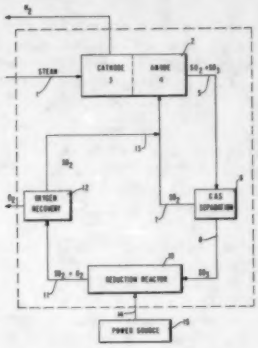
1. A method of decomposing water vapor into hydrogen and oxygen comprising the steps of:

(1) supplying SO_2 gas to the anode and water vapor to the cathode of an electrolysis cell utilizing a solid oxide electrolyte between the anode and cathode of the cell, said solid oxide electrolyte having a high oxygen ion conduction, said cell operating at a temperature of between 350° C. and 1,000° C., to provide H_2 gas, and a gas mixture consisting of SO_2 gas and SO_3 gas;

(2) collecting the H_2 gas;

(3) passing SO_3 into a reduction reactor operating at a temperature effective to catalytically decompose the SO_3 and provide a mixture of SO_2 gas and O_2 gas;

(4) collecting the O_2 gas from step (3); and



(5) passing SO_2 gas to the anode of the solid oxide electrolyte electrolysis cell.

4,412,896

PROCESS OF PREPARATION OF GRAFT COPOLYMER OF STYRENE AND AN EPDM RUBBER

Maurice Lemattre, Cambronne Les Ribecourt; Robert Roussel, Mazingarbe, and Rene Wirth, Lens, all of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Jul. 8, 1981, Ser. No. 281,533
Claims priority, application France, Jul. 10, 1980, 80 15343
Int. Cl.³ C08F *2/02*; C08J *3/28*; C08F *255/06*
U.S. Cl. 204—159.2 **20 Claims**

1. A process for preparing a crosslinked graft copolymer of styrene and an EPDM rubber, consisting essentially of mass polymerizing a solution of the EPDM rubber in styrene and recovering the resultant graft copolymer and thereafter crosslinking the resultant copolymer by irradiation treatment.

4,412,897

PROCESS FOR RENDERING POLYMERS RESISTANT TO IONIZING RADIATION, AND COMPOSITIONS OBTAINED THEREBY

Simon Kornbaum, Caluire, and Jean-Yves Chenard, Pau, both of France, assignors to Ato Chimie, France

Filed Oct. 9, 1981, Ser. No. 310,121
Claims priority, application France, Oct. 13, 1980, 80 21816
Int. Cl.³ C08F *8/00, 8/06*
U.S. Cl. 204—159.2 **16 Claims**

1. In a process for the ionization radiation of a vinylic halide polymer at doses sufficient to cause sterilization, the polymer incorporating a composition which is effective for preventing the discoloration produced thereby, the improvement which comprises said composition comprising an organotin or organic antimony containing heat stabilizer, and a mercaptan of the formula

$$R-\underset{\displaystyle SH}{\underset{|}{CH(CH_2)_nCOR'}},$$

$R(CH_2)_mCOOR''SH$ or $HS(CH_2)_x—Z(CH_2)_y—Z(CH_2)_xSH$ in which R is hydrogen or C_{1-20} alkyl, R′ is C_{1-18} alkyl or alkenyl, R″ is C_{1-18} alkylene or alkenylene, n and m are integers of 0–6, Z is

in which the carbon atom is bound to a chain carbon atom, x is an integer of 1–9, y is an integer of 1–18, the sum (2 x+y) is at least 4, and in which the $(CH_2)_x$ and $(CH_2)_y$ groups are unsubstituted or are —OH or —SH substituted, and hydroquinone.

4,412,898

PROCESS FOR CHLORINATION OF PVC IN WATER WITHOUT USE OF SWELLING AGENTS

Alan J. Olson, Westlake, and Robert G. Vielhaber, Doylestown, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 181,521, Aug. 26, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 350,982

Int. Cl.³ C08F *8/18*

U.S. Cl. 204—159.18 **6 Claims**

1. A process for producing chlorinated poly(vinyl chloride) resin having a density within the range from about 1.50 to 1.65 g/cc at 25° C., comprising:

(a) introducing an aqueous suspension of poly(vinyl chloride) containing from about 15 to about 35% by wt poly(-vinyl chloride) into a reactor operable under elevated pressure;

(b) removing essentially all oxygen from said suspension and reactor;

(c) introducing chlorine into the reactor until the pressure therewithin is in the range from about 10 psig to about 100 psig;

(d) soaking the poly(vinyl chloride) under said pressure for a period of from about 1 minute to about 45 minutes at a "soak" temperature in the range from about 60° C. to about 85° C.;

(e) irradiating the poly(vinyl chloride) with ultraviolet light at a relatively high and constant intensity in the range from about 2 watts to about 50 watts per gallon of said aqueous suspension;

(f) increasing the temperature of said suspension by at least 5° C.

autogenously from said soak temperature to a finishing temperature in the range from about 80° C. to about 120° C.;

(g) maintaining a finishing temperature in the range from about 80° C. to about 120° C. during chlorination;

(h) continuing to introduce chlorine into the reactor as the reaction proceeds, so that the pressure in the reactor is maintained substantially constant within said range of pressure;

(i) stopping flow of chlorine into the reactor when sufficient chlorine has been added to produce a suspension of chlorinated poly(vinyl chloride) having said density upon completion of the reaction; and,

(j) separating solid macrogranular chlorinated poly(vinyl chloride) from said suspension of chlorinated poly(vinyl chloride) product characterized by having a heat distortion temperature measured by ASTM Test Method D648 which is in the range from about 100° C. to about 135° C.

4,412,899

CUBIC BORON NITRIDE PREPARATION UTILIZING NITROGEN GAS

Harry A. Beale, Columbus, Ohio, assignor to Applied Coatings International, Inc., Columbus, Ohio

Filed Feb. 7, 1983, Ser. No. 464,300

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **7 Claims**

1. A method for depositing cubic boron nitride on a substrate, comprising the steps of:

(a) heating a supported substrate in a vacuum;

(b) supplying metal vapors into a zone between said substrate and a metals source, said source comprising a material selected from the broup consisting of:

boron,

boron and a material selected from the group consisting of the elements chromium, nickel, cobalt, and manganese,

a metal alloy consisting essentially of from 0.1 weight percent to 5.0 weight percent of at least one of the elements chromium, nickel, cobalt, and manganese, the balance being boron,

and a metal alloy consisting essentially of at least 60 percent by weight to the balance of boron with from 0.2 to 12 percent by weight of aluminum, and at least 0.2 to 24 percent by weight of at least one of cobalt, nickel, manganese, or other aluminide-forming element;

(c) introducing nitrogen gas into said zone;

(d) generating an electrical field in said zone ionizing the metal vapors and gas atoms in the zone; and

(e) maintaining an electrically negative bias impressed on said substrate depending upon the process employed and in accordance with the following schedule:

Process	Bias Voltage
Reactive Evaporation (Electron Beam)	−500 to −3000 volts
Reactive Sputtering (DC)	−200 to −3000 volts
Reactive Sputtering (RF)	−100 to −3000 volts
Reactive Sputtering (Magnetron)	−500 to −3000 volts
Arc Discharge	−20 to −2000 volts

whereby cubic boron nitride is deposited on the surface of said substrate.

4,412,900

METHOD OF MANUFACTURING PHOTOSENSORS

Yasuo Tanaka, Kokubunji; Akira Sasano, Hinodemachi; Toshihisa Tsukada, Tokyo, and Yasuharu Shimomoto, Hinodemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,076

Claims priority, application Japan, Mar. 13, 1981, 56-35313; Oct. 21, 1981, 56-16720

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 P **27 Claims**

1. A method of manufacturing a photosensor comprising the steps of:

forming a photoconductor film of amorphous material made chiefly of silicon and containing hydrogen on a substrate;

forming a transparent conductive film capable of transmitting light and of conducting electricity on said photoconductor film by sputtering, and

heating said photosensor with said transparent conductive film in a temperature range of from at least about 140° C. to not greater than about 280° C.

4,412,901

METHOD FOR THE MANUFACTURE OF SOLID ELECTROLYTE LAYERS FOR GALVANIC CELLS

Peter Hartwig, Hirschberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,902

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205919

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C **7 Claims**

1. A method for the manufacture of solid electrolyte layers for galvanic cells which comprises depositing a very thin, firmly adhering, coherent, compact layer of at least one lithium nitride halogenide onto a substrate, wherein the lithium nitride halogenide is deposited onto the substrate by atomizing it from a pressed or sintered target of lithium nitride halogenide in a cathode sputtering system with a discharge voltage of at least

about 300 volts, at a pressure of less than about 1×10^{-1}mb and utilizing a plasma-generating gas that comprises at least about 55% by weight of a gas selected from the group consisting of helium, nitrogen and mixtures thereof.

4,412,902

METHOD OF FABRICATION OF JOSEPHSON TUNNEL JUNCTION

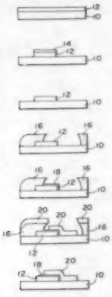
Osamu Michikami, Tohkai; Yujiro Katoh, Mito; Keiichi Tanabe, Mito; Hisataka Takenaka, Mito, and Shizuka Yoshii, Mito, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Musashino, Japan

Filed Jun. 18, 1982, Ser. No. 390,116

Claims priority, application Japan, June 22, 1981, 56-96129; Jul. 6, 1981, 56-105342; Aug. 3, 1981, 56-121577; Aug. 3, 1981, 56-121578; Aug. 17, 1981, 56-128439; Feb. 16, 1982, 57-24194

Int. Cl.³ C23C *15/00*; **H01L** *39/22*

U.S. Cl. 204—192 E **30 Claims**



1. A method for the fabrication of a Josephson tunnel junction device which comprises the steps of:

(a) forming a base electrode film of a first superconductor metal on a substrate;

(b) subjecting a surface of the base electrode film to sputter cleaning in the presence of a halogenated hydrocarbon selected from the group consisting of fluorinated hydrocarbons (C_nF_{2n+2}:n=1~4), trifluoromethane (CHF_3), trichlorofluoroethane (CCl_3F), trifluorobromomethane ($CBrF_3$), dichlorodifluoromethane (CCl_2F_2), trifluoroethane ($C_2H_3F_3$) and pentafluoroethane (C_2HF_5);

(c) oxidizing the cleaned surface of the base electrode in the presence of a gas mixture of oxygen and inert gas to form an oxide layer on the base electrode; and

(d) forming a counter electrode film of a second superconductor metal on the oxide layer.

4,412,903

COATING INFRA RED TRANSPARENT SEMICONDUCTOR MATERIAL

Geoffrey W. Green, Malvern, and Alan H. Lettington, Worcester, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 14, 1981, Ser. No. 292,433

Claims priority, application United Kingdom, Aug. 21, 1980, 8027279

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C **7 Claims**

1. A method of coating an infra red transparent germanium or silicon element with a layer of hard carbon comprising the steps of:

(i) placing the element on a cathode structure in a vacuum chamber,

(ii) substantially evacuating the chamber,

(iii) heating the substrate to a temperature not exceeding 300° C.,

(iv) admitting a hydrocarbon gas into the chamber while maintaining a substantial vacuum,

(v) applying a D.C. voltage between the cathode and an anode in the chamber, and

(vi) maintaining the substrate temperature below 300° C., whereby a glow discharge is initiated and maintained in the chamber so that carbon ions strike the element and build up a hard carbon layer substantially transparent to infra red radiation.

4,412,904

ELECTROCHEMICAL MEASURING CELL

Franz-Josef Rohr, Abtsteinach, and Andreas Reich, Heidelberg, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,549

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128738

Int. Cl.³ G01N *27/26*

U.S. Cl. 204—424 **7 Claims**

1. In an electrochemical measuring cell, in particular for the determination of the oxygen content in gases, having a solid electrolyte and at least one electrode connected to the electrolyte for the transfer of an electric current by the flow of electrons therebetween, the improvement comprising disposing the electrode on the electrolyte in the form of a layer containing electron-conducting ceramic material together with a metallic material having an electron-conductivity greater than the electron-conductivity of the ceramic material in an amount sufficient to increase the electron-conductivity of the electrode to a predetermined value, said metallic material consisting of small solid particles containing only metallic material, and said small particles embedded in the layer without substantial loss of particulate identity.

4,412,905

VACUUM DEPOSITION APPARATUS

Mohammed N. Khan, Wembley, England, assignor to Dowty Electronics Limited, Acton, England

Filed Apr. 27, 1983, Ser. No. 489,162

Claims priority, application United Kingdom, May 12, 1982, 8213847

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **1 Claim**

1. A vacuum deposition apparatus including a cathode, an anode associated with the substrate to be coated, and means providing a magnetic field whose lines of force are directed substantially parallel to the surface of the substrate to be coated, are at least closely adjacent to that surface and are of such strength as substantially to direct high-energy electrons away from the surface.

4,412,906

SPUTTERING APPARATUS

Yasuhiko Sato; Takamasa Sakai, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,996

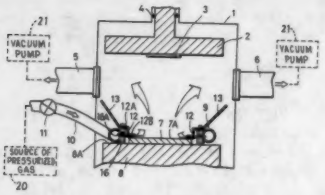
Claims priority, application Japan, Dec. 27, 1980, 55-185709

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **3 Claims**

1. A sputtering apparatus, comprising a vacuum chamber, substrate holding means supported within said vacuum chamber for holding a substrate, target supporting means supported within said vacuum chamber for supporting a target in opposition to said substrate, a plurality of gas withdrawal conduits communicating with said vacuum chamber at locations adjacent said substrate holding means, gas supply means for supplying a gas to said vacuum chamber in a manner so that the gas pressure gradually decreases from the region of said target to the region of said substrate, said gas supply means including gas jet opening means located near a surface of said target, means defining a fin near said gas jet opening means for guid-

ing the gas flow as it leaves said target, and gas guide means in the region of said gas jet opening means for jetting the gas



entering said vacuum chamber through said gas jet opening means directly toward said surface of said target.

4,412,907

FERROMAGNETIC HIGH SPEED SPUTTERING APPARATUS

Akio Ito; Kyuzo Nakamura; Yoshifumi Ota, all of Yachimata, and Taiki Yamada, Chiba, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Filed Jul. 23, 1982, Ser. No. 401,079
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—298 7 Claims

1. A ferromagnetic, high speed, sputtering apparatus comprising:

(a) a vacuum chamber;

(b) a target means of ferromagnetic material, positioned in said vacuum chamber, said target means comprising at least two segments positioned adjacent to one another with a gap therebetween, wherein said gap has at least a portion thereof which does not extend in the direction of the thickness of said target means;

(c) substrate means in said vacuum chamber positioned facing one side of said target means; and

(d) magnetic field generating means positioned on the other side of said target means such that the magnetic field therefrom leaks through said gap.

4,412,908

PROCESS FOR THERMAL HYDROCRACKING OF COAL

Kunihiko Yamashita, Kurashiki, and Muneaki Kimura, Fuji, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 7, 1982, Ser. No. 366,125
Claims priority, application Japan, Apr. 7, 1981, 56-52162; Jun. 8, 1981, 56-87813
Int. Cl.[3] C10G *1/06*
U.S. Cl. 208—8 R 10 Claims

1. A process for liquefying and gasifying coal by thermal treatment in the presence of hydrogen gas for hydrocracking, said process comprising the following sequential uninterrupted three steps:

(1) injecting coal fines into a heated hydrogen gas stream at a pressure of from 35 to 250 kg/cm^{2}G such that they are rapidly heated to a temperature of from 750° to 1100° C. for thermal cracking thereof; immediately thereafter

(2) reducing the temperature of the reaction product stream while subjecting the resulting product to hydrocracking for a period of from 1.0 to 60 seconds at a temperature that is lower than the temperature used in step (1) and which is in the range of from 570° to 850° C.; and

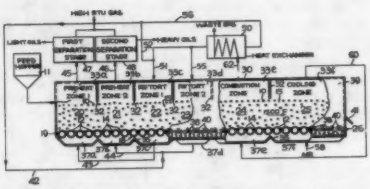
(3) rapidly quenching the reaction product of step (2) to not lower than 350° C. to stop the hydrocracking.

4,412,909

PROCESS FOR RECOVERY OF OIL FROM SHALE

Bobby P. Faulkner, New Berlin, and Michael H. Weinecke, Franklin, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 31, 1981, Ser. No. 336,266
Int. Cl.[3] C10B *53/06;* C10G *1/00*
U.S. Cl. 208—11 R 21 Claims



1. A method of recovering oil from oil bearing shale particles comprising the steps of

forming a non-fluidized bed of said particles on a plurality of rotatable horizontal apertured cylindrical rollers having elongated filler members in the nip between adjacent rollers with the upper surfaces of said filler members disposed below the upper surfaces of said rollers,

transporting said bed along a path of travel transverse to the axes of said rollers by rotating said rollers to frictionally engage their cylindrical surfaces with said particles and transfer said particles onto and across said filler members and continuously agitate said particles as they are transported, said roller rotating step being at a circumferential velocity substantially higher than the velocity of said bed along said path of travel,

passing through the apertures in said rollers and said bed at spaced apart points along said path of travel a plurality of discrete streams of nonoxidizing gas free of products of combustion and heated to different temperatures sufficiently high to vaporize and educe different weight fractions of the oil from said particles as vapors into said gas streams, said temperatures being below the cracking temperatures of said fractions,

individually withdrawing said gas streams along said bed, and

separating said different weight oil fractions from said gas streams.

4,412,910

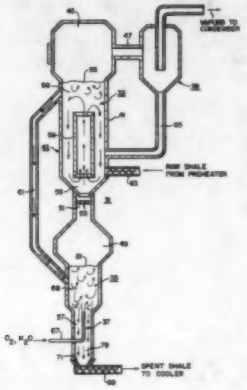
RECOVERY OF FUEL FROM OIL SHALE

David H. Archer, Ross Township, Allegheny County, and M. Mushtaq Ahmed, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1981, Ser. No. 313,447
Int. Cl.[3] C10G *1/00;* C10B *53/06, 49/10*
U.S. Cl. 208—11 R 10 Claims

1. The method of recovering fuel from oil shale with apparatus including a pyrolyzer and a gasifier, wherein a stream of particles of raw shale is fed into the pyrolyzer and is to be heated in said pyrolyzer to thereby produce shale oil, product gas, including volatile compounds from said shale, and pyrolyzed shale containing residual carbon, the said method comprising supplying to said gasifier gas including oxygen and steam, transferring said pyrolyzed shale from said pyrolyzer to said gasifier, passing said gas in said gasifier through said pyrolyzed shale, to produce a fluidized bed of said pyrolyzed shale, reacting said oxygen and steam chemically with said pyrolyzed shale in said fluidized bed in said gasifier to produce hot fuel gas and hot spent shale, the quantity of oxygen supplied being substantially less than that required to react completely with said residual carbon contained in said pyrolyzed shale and the quantity of steam supplied being sufficient to react with substantially the remainder of said residual carbon whereby said

fuel gas is produced, transmitting said hot fuel gas to said pyrolyzer, passing said hot fuel gas through said raw shale at the bottom of said fluidized bed to produce a fluidized bed of said raw shale, contacting said hot fuel gas with said raw shale in said fluidized bed in said pyrolyzer thermally to heat said



raw shale, the heating of said raw shale by said hot fuel gas separating said oil and product gas from said raw shale, transmitting said product gas and fuel gas resulting from the reaction of the steam and oxygen with said residual carbon from said pyrolyzer to a facility for separating said product gas as a fuel, and collecting the oil separated from said raw shale.

4,412,911

PROCESS FOR REACTIVATING PEROVSKITE CATALYSTS AND HYDROCARBON TREATING PROCESSES UTILIZING THE REACTIVATED CATALYSTS

Robert C. Schucker, and Kenneth S. Wheelock, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 24, 1982, Ser. No. 351,967

Int. Cl.³ C10G *11/02, 45/04, 47/02;* B01J *37/16*

U.S. Cl. 208—121 **23 Claims**

1. A process for reactivating the activity of a partially deactivated catalyst comprising a perovskite having at least one alkaline earth metal constituent selected from the group consisting of barium, beryllium, magnesium, calcium, strontium and mixtures thereof, said catalyst having been partially deactivated by exposure to steam and an oxidizing agent, which comprises the step of contacting said partially deactivated catalyst with a reducing gas, at reducing conditions for a time sufficient to reactivate said catalyst.

11. A hydrocarbon treating process which comprises contacting a hydrocarbonaceous feed at hydrocarbon treating conditions with a catalyst that has been reactivated by a process which comprises contacting a partially deactivated catalyst comprising a perovskite having at least one alkaline earth metal constituent selected from the group consisting of barium, beryllium, calcium, strontium and mixtures thereof, said catalyst having been partially deactivated by exposure to steam and an oxidizing agent, with a reducing gas, at reducing conditions for a time sufficient to reactivate said catalyst.

4,412,912

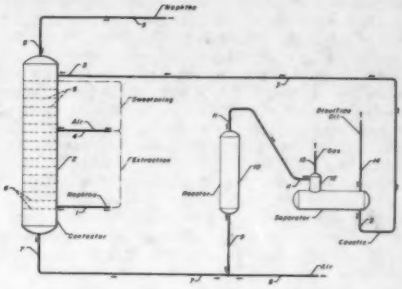
HYDROCARBON TREATING PROCESS HAVING MINIMUM GASEOUS EFFLUENT

George Asdigian, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 1, 1983, Ser. No. 471,116

Int. Cl.³ C10G *19/02*

U.S. Cl. 208—206 **18 Claims**



1. A process for treating hydrocarbons which comprises the steps of:

(a) countercurrently contacting a liquid-phase alkaline aqueous stream and a liquid-phase feed stream comprising mercaptans and hydrocarbons having boiling points under about 650° F. along the height of a vertical contacting zone; and,

(b) injecting an oxygen-containing stream into an intermediate point in the contacting zone, with the oxygen reacting with mercaptans in the presence of a mercaptan oxidation catalyst, and thereby effecting a sweetening treatment of the feed stream above the point at which the oxygen-containing stream enters the contacting zone and a mercaptan extraction treatment of the feed stream below the point at which the oxygen-containing stream enters the contacting zone.

4,412,913

USE OF ALKANOLAMINES IN SWEETENING SOUR LIQUID HYDROCARBON STREAMS

Truman P. Moote; Myron L. Dunton, both of Tulsa; Russell L. McGalliard, Broken Arrow, all of Okla., and Lyman Yarborough, Kingwood, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 5, 1982, Ser. No. 405,493

Int. Cl.³ C10G *29/02*

U.S. Cl. 208—207 **7 Claims**

1. A method for sweetening a liquid hydrocarbon stream containing mercaptans by converting the latter into their corresponding hydrocarbon soluble disulfides, which consists essentially of

contacting said liquid hydrocarbon stream with an agent and an oxygen containing gas under effective oxidizing conditions, and wherein

the agent consists essentially of an alkanolamine.

4,412,914

ENDOTHERMIC REMOVAL OF COKE DEPOSITED ON SORBENT MATERIALS DURING CARBO-METALLIC OIL CONVERSION

William P. Hettinger, Jr., Russell, Ky.; James F. Hoffman, Huntington, W. Va., and Stephen M. Kovach, Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 10, 1981, Ser. No. 291,656

Int. Cl.³ C10G *29/04*

U.S. Cl. 208—253 **38 Claims**

1. In a process combination for preparing premium products

from residual oils comprising metal contaminants and Conradson carbon producing components by contact with solid sorbent clay particle material to lay down metal contaminants and Conradson carbon hydrocabonaceous material components on said clay particles from said residual oil before effecting fluid catalytic cracking of a resultant demetallized and decarbonized residual oil product and regenerating the solid sorbent particle material comprising substantial Conradson carbon hydrocarbonaceous material and metal deposits by combusting said hydrocarbonaceous material with an oxygen containing gas, the improvement for limiting and controlling temperatures encountered during combustion of substantial hydrocarbonaceous deposits on said solid particles which comprises:

A. initially contacting said solid sorbent clay particle material comprising hydrocarbonaceous material and metal deposits with a quantity of oxygen containing gas under conditions restricting the regeneration temperature within the range of 1350° to 1600° F. during partial removal of deposited hydrocarbonaceous material by combustion and

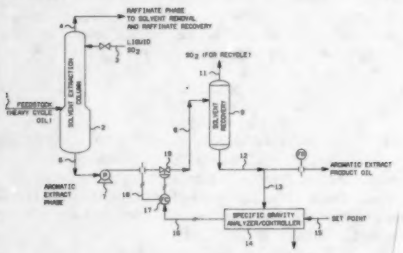
B. removing at a sufficiently high rate greater than 40 weight percent of carbonaceous material deposits from said solid sorbent material with carbon dioxide following said initial oxidation step at temperatures up to 1600° F. while maintaining at least 0.5 weight percent of metal additive elements on said sorbent particles selected from the group comprising one or more of Li, Na, Sr, Re, Fe, Co, Ni, Ru, Rh, Pt, Pd, Os, Ir, Cu, Ag and Au during said contact with carbon dioxide.

4,412,915

SPECIFIC GRAVITY RESPONSIVE CONTROL OF BMCI IN AROMATIC EXTRACT OILS

James G. Kettinger, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 8, 1981, Ser. No. 300,148
Int. Cl.³ C10G *21/30*
U.S. Cl. 208—311 **3 Claims**



1. In a solvent extraction process a method for maintaining a constant BMCI for an aromatic extract oil which comprises controlling the removal rate of the aromatic extract oil from a solvent extraction zone in response to the specific gravity of the aromatic extract oil removed from said solvent extraction zone.

4,412,916

AIRLESS ARTIFICIAL KIDNEY ASSEMBLY

Michael J. Kell, Decatur, Ga., assignor to Cordis Dow Corp., Miami, Fla.

Filed Jun. 24, 1981, Ser. No. 276,751
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—90 **14 Claims**

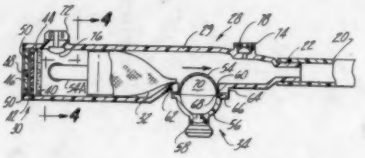
1. An airless artificial kidney assembly comprising

(1) an artificial kidney having inlet and outlet ports,

(2) a liquid-tight subassembly having a filter, microporous vent means for venting to atmosphere gas bubbles separated from liquid in said subassembly and preventing gas entry through said vent means into said subassembly, pressure measuring means for continuously monitoring the pressure of liquid in said subassembly, a housing for blood having an upper region and an outlet connector communicating with said housing for discharging blood therefrom,

(3) a first tube secured at one end to said kidney inlet port and terminating at its opposite end in a connector for connecting said first tube with a patient,

(4) a second tube secured at one end to said outlet connector of said subassembly and terminating at its opposite end in



a connector for connecting said second tube with a patient,

(5) said kidney outlet port opening into said housing for discharging blood thereinto,

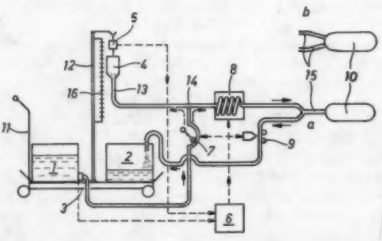
said filter being arranged for filtering blood flowing from said kidney outlet port to said outlet connector, said vent means comprising an upwardly opening microporous hydrophobic vent in communication with said upper region of said housing for receiving and discharging air bubbles therefrom, and means containing an aqueous solution overlying said vent for preventing downward flow of air through said vent into said housing.

4,412,917

WEIGHT CONTROLLED AND HYDROSTATIC PRESSURE ADJUSTABLE PERITONEAL DIALYSIS APPARATUS

Hannu T. Ahjopalo, Helsinki, Finland, assignor to Instrumentarium oy, Helsinki, Finland

Filed May 22, 1981, Ser. No. 266,285
Claims priority, application Finland, May 28, 1981, 801718
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—104 **7 Claims**



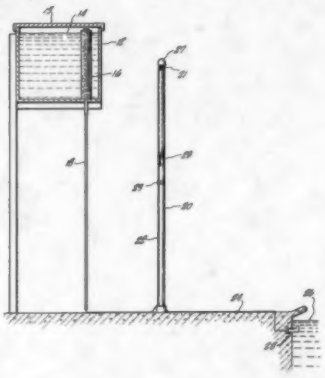
1. An apparatus for peritoneal dialysis, comprising a first vessel to contain a dialysis fluid; a second vessel to contain spent dialysis fluid; conduit means for interconnecting said first and second vessels with the abdominal cavity of a patient; pumping means in said conduit means for pumping the dialysis fluid directly into the abdominal cavity; flow control means in said conduit means for controlling the amount of dialysis fluid removed from said abdominal cavity; a branch conduit interconnected with said conduit means at a location between said pumping means and said abdominal cavity and having a hydrostatic pressure equalizing section disposed at a higher level than said abdominal cavity, said pumping means and conduit means providing fluid flow into the abdominal cavity simulta-

neously with pumping against hydrostatic liquid pressure in said pressure equalizing section; weighing means for measuring the weight of said first vessel, said second vessel, and said equalizing section; and control means operably connected to said pumping means and to said flow control means and responsive to the weight as determined by said weighing means for controlling the operation of said pumping means and said flow control means to obtain the desired flow of fluid through said conduit means.

4,412,918
AUTOMATIC AND CONTINUOUS CHEMICAL FEED SYSTEM

David A. Rickett, 15600 Del Prado Dr., Hacienda Heights, Calif. 91745

Continuation-in-part of Ser. No. 171,983, Jul. 24, 1980, Pat. No. 4,349,437. This application Mar. 5, 1982, Ser. No. 354,148
The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.
Int. Cl.³ B01D *33/38*
U.S. Cl. 210—169 **14 Claims**



1. An automatic and continuous chemical feed system for the introduction of a chemical solution into a liquid body comprising:

a vessel vented to maintain atmospheric pressure which contains the chemical solution to be introduced into the liquid body, said vessel being fixably positioned such that the level of the chemical solution in the vessel is above the high liquid level of the liquid body, and said vessel having an opening near the base thereof;

a means for filtering said chemical solution as the solution flows out of the vessel;

a downcomer means connected to said filter means and extending towards the ground, said downcomer means having an inner diameter sufficiently large to spontaneously vent any gases which are formed in the chemical solution back through said filter means and into said vessel;

a standpipe means to regulate changes in the flow of the chemical solution;

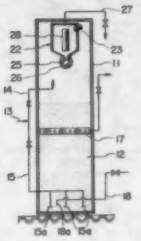
a tubular connecting means to connect said downcomer means and said standpipe means so that the chemical solution flows therebetween, said tubular connecting means initially determining the flow rate of the chemical solution;

a tubular conveyance means attached to said standpipe means to convey the chemical solution to a selected location in or above the liquid body.

4,412,919
WATER PURIFICATION DEVICE

Yoshihiko Ueda, Yamaguchi, Japan, assignor to Takara Kogyo Co., Ltd., Tokyo, a part interest

Filed Apr. 26, 1982, Ser. No. 372,235
Int. Cl.³ B01D *29/38*
U.S. Cl. 210—189 **7 Claims**



1. A water purification device comprising:

a filter tank having water inlet means for the admission of water to be filtered and washing water thereinto, and filtered water outlet means;

granular filter material for filtering of water and the like filling the lower portion of said filter tank with a space in said filter tank above said filter material;

a separation tank mounted in said space in said filter tank and having a washing water inlet in the upper portion thereof from said space and directed generally tangentially of said separator tank;

a washing water outlet means lying generally along the central vertical axis of said separation tank and communicating with the outside of the filter tank;

a rod-like member positioned along said vertical axis of said separation tank, whereby when washing water is caused to flow into the tank and entrains the filter material and fills the tank, the filter material carrying washing water is directed by said washing water inlet in a vortex down along the inside surface of the wall of the separation tank, then inwardly thereof, and then along the peripheral surface of said rod-like member in reverse flow of water traveling upwards of the member with a gyratory motion and is discharged through said washing water outlet means; and

a granular filter material outlet at the bottom of said filter material separation tank and having a cover means for closing and opening said outlet.

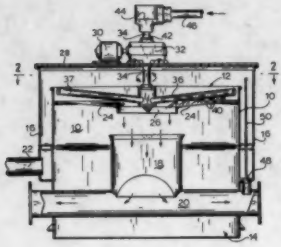
4,412,920
FILTER WITH TOP SPRAY

Joseph A. Bolton, Summit La., Glens Falls, N.Y. 12801, and Armond A. Brown, Burgoyne Rd., #6, at the Point, Saratoga Spa., N.Y. 12866

Continuation-in-part of Ser. No. 92,045, Nov. 7, 1979, abandoned. This application Mar. 25, 1981, Ser. No. 247,336
Int. Cl.³ B01D *29/38*
U.S. Cl. 210—409 **7 Claims**

1. A filter separation device including a filter screen, a surface of said filter screen, means for flowing a first liquid containing particulate over said surface, a particulate receiving opening formed in said screen, and spray nozzles above said surface and arranged with respect to said screen to impinge cleansing liquid on said surface at an angle thereto in the range of 10° to 45° to direct particulate disposed thereon by said first liquid towards said opening, rotary support means for rotating said spray nozzles about an axis which passes through said

opening, said spray nozzles further being arranged on said rotary support means such that said cleansing liquid can carry



particulate continuously and in a spiral fashion towards said particulate receiving opening.

4,412,921

DRY, PARTICULATE, INORGANIC ULTRAFILTRATION MEMBRANES AND THE PRODUCTION THEREOF

Pak S. Leung, Highland Mills, and Anthony R. Cacciola, Pleasantville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 879,391, Feb. 21, 1978, abandoned. This application Apr. 15, 1981, Ser. No. 254,488
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—500.2 21 Claims

1. A process for the production of a dry, inorganic ultrafiltration membrane comprising:

(a) pretreating a microporous membrane support with a volatile liquid medium prior to the coating of said support with a membrane coating material, said liquid medium being non-solvating to said coating material and capable of drawing said coating material into said support and of desolvating said coating material;

(b) coating the surface of said pretreated microporous membrane support with said membrane coating material; and

(c) exposing the thus-coated membrane to a temperature capable of volatilizing said liquid medium to remove said liquid medium from the microporous membrane support and said membrane coating material, whereby the desolvation of said coating material prior to completion of removal of said liquid medium results in a shrinking of the coating material and the consequent filling, by said coating material, of voids produced as a result of said shrinking, thus avoiding the development of microscopic cracks that otherwise occur upon desolvation of the coated membrane, thereby forming an essentially crack-free mechanically and chemically stable membrane.

21. A dry inorganic ultrafiltration membrane produced by the process defined in any one of claims 1, 19, 20 and 2 to 18, inclusive.

4,412,922

POSITIVE-CHARGED ULTRAFILTRATION MEMBRANE FOR THE SEPARATION OF CATHODIC/ELECTRODEPOSITION-PAINT COMPOSITIONS

Leon Mir, Newton, Mass., assignor to Abcor, Inc., Wilmington, Mass.

Continuation of Ser. No. 165,279, Jul. 2, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,012
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—638 14 Claims

1. A method for the concentration of an aqueous cationic electrodeposition-paint composition, which method comprises:

(a) providing a foul-resistant polyvinylidene fluoride polymer membrane prepared by treating a negative-charged polymer membrane material, having fixed negative-charged groups in the polymer, with a polyelectrolyte polymer having fixed positive-charged nitrogen groups in an amount sufficient to provide for an excess of positive-charged groups in the treated membrane polymer; and

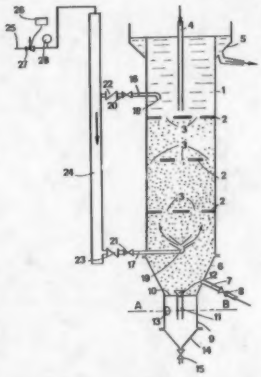
(b) employing the foul-resistant polymer membrane in the ultrafiltration concentration of a cationic electrodeposition-paint composition, whereby concentration of the paint composition is accomplished with high flux rate and with a long membrane use life.

4,412,923

PROCESS AND APPARATUS FOR EXTRACTING IONS FROM A CLEAR LIQUID OR A LIQUID CONTAINING MATERIALS IN SUSPENSION BY CONTACT WITH AN EXCHANGE SUBSTANCE

Enzo Capitani, Saignes, and Jean Teissie, Chamarande, both of France, assignors to Societe Centrale de l'Uranium et des Minerais et Metaux Radioactifs Scumra, Paris, France

Filed Mar. 1, 1982, Ser. No. 353,169
Claims priority, application France, Mar. 5, 1981, 81 04900
Int. Cl.³ B01J *47/10*
U.S. Cl. 210—661 7 Claims



1. A process for continuous ion exchange between a liquid and a mobile bed of grains of ion exchange substances disposed in a vertical column and comprising the steps of:

continuously introducing liquid to be treated into the lower end of the column and upwardly through the bed to continuously maintain the grains in a fluidized state;

introducing regenerated grains of the ion exchange substances into the upper end of the column to maintain the bed with generally downward movement of the grains in countercurrent flow relation to the upward movement of the liquid;

subjecting the fluidized bed to cyclic pulsation by withdrawing treated liquid from the upper end of the column and rapidly and continuously periodically introducing the treated liquid upwardly into the lower end of the bed whereby density grading of grains is effected; and

continuously removing spent grains from the lower end of the column without interfering with the feed of liquid to be treated.

4,412,924

WATER PURIFICATION SYSTEM

Orval R. Feather, 2464 Bunker Hill, Ann Arbor, Mich. 48105

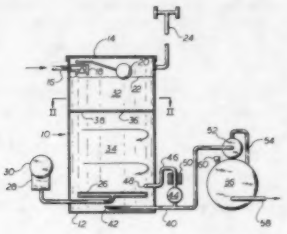
Filed Dec. 29, 1981, Ser. No. 335,536
Int. Cl.³ C02B *1/10*
U.S. Cl. 210—744 14 Claims

1. The method of treating water utilized by a water system

pressurized by an intermittingly operated pump to remove high concentrates of hydrogen sulfide, the water system having a known average volume requirement within a predetermined interval, comprising the steps of:

(a) storing a volume of water greater than that required during the known requirement interval within first and second chambers,

(b) air-stripping the stored water within the first chamber by aeration to rapidly reduce the high hydrogen sulfide concentrate,



(c) transferring the air-stripped water to the second chamber at a rate determined by the pump during normal water usage,

(d) intermixing ozone with the air-stripped water within the second chamber to remove low concentrates of hydrogen sulfide from the water, and

(e) removing water from the second chamber by the pump during normal water usage.

4,412,925

ASSISTED OIL RECOVERY WITH USE OF FERMENTATION FLUIDS

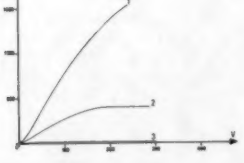
Daniel Ballerini, Saint Germain en Laye; Odile Chaude, Sevres; Guy Chauveteau, Rueil Malmaison; Norbert Kohler, Paris, and Jean-Paul Vandecastele, Fourqueux, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Rhone-Poulenc Industries, Paris, both of, France

Filed Jun. 29, 1978, Ser. No. 920,522

Claims priority, application France, Jul. 25, 1977, 77 23008

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—8.55 D **22 Claims**



1. An aqueous composition suitable for direct use in waterflood oil recovery processes, which comprises a clarified and stabilized fermentation fluid containing at least one bactericidal agent, said clarified and stabilized fermentation fluid being obtained by a process consisting essentially of the steps of:

(a) culturing a polysaccharide-producing microorganism in an aqueous culture medium to produce an aqueous culture containing dissolved polysaccharide therein; and

(b) clarifying and stabilizing the resultant aqueous culture from step (a), the clarification being effected by at least one of centrifugation and filtration, and the stabilization being effected by introducing therein at least one bactericidal agent, and recovering the resultant clarified and stabilized fermentation fluid containing said at least one bactericidal agent;

whereby said aqueous composition is obtained without precipitation and recovery of a solid polysaccharide and dissolution thereof in an aqueous medium and is suitable for direct use in waterflood oil recovery processes.

4,412,926

ALKYL NORBORNYL ETHER SULFONATES USEFUL FOR SOLUBILIZING PETROLEUM SULFONATES IN OIL FLUID BRINE SOLUTIONS

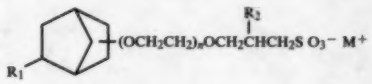
Edward C. Y. Nieh; Carter G. Naylor, both of Austin, and Clifford L. Lambert, Georgetown, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,493

Int. Cl.³ E21B *43/22*; C07C *143/20*

U.S. Cl. 252—8.55 D **8 Claims**

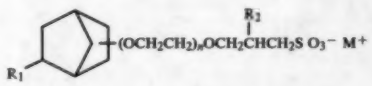
1. An alkyl norbornyl ether sulfonate of the formula:



wherein R_1 is a substantially linear alkyl group of 4 to 12 carbon atoms; R_2 is selected from the group consisting of hydrogen and methyl; M is a cation selected from the group consisting of potassium, sodium and ammonium and n is an integer of from 1 to 12.

6. An aqueous brine solution comprising:

(a) about 0.1 wgt% to about 2 wgt% of an alkyl norbornyl ether sulfonate of the formula:



wherein R_1 is a substantially linear alkyl group of 4 to 12 carbon atoms; R_2 is selected from the group consisting of hydrogen and methyl; M is a cation selected from the group consisting of potassium, sodium and ammonium and n is an integer of from 1 to 12 and;

(b) about 0.1 weight % to about 4 weight % of a petroleum sulfonate.

4,412,927

PROCESS FOR THE PREPARATION OF SUPERALKALINIZED METALLIC DETERGENT-DISPERSANTS FOR LUBRICATING OILS AND PRODUCTS OBTAINED THEREFROM

Bernard Demoures, Puteaux, and Jean-Louis Le Coent, Le Havre, both of France, assignors to Orogil Corporation, Courbevoie, France

Continuation of Ser. No. 49,958, Jun. 19, 1979, abandoned. This application Feb. 19, 1982, Ser. No. 350,282

Claims priority, application France, Jun. 26, 1978, 78 18947

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.³ C10M *1/40*

U.S. Cl. 252—33.3 **20 Claims**

1. A process of preparing a detergent-dispersant composition from an alkaline-earth metal alkylbenzene sulfonate, a sulfurized alkylphenate of an alkaline-earth metal, an alkaline-earth metal compound, an alkylene glycol, and carbon dioxide comprising the steps of:

(1) carbonating, with carbon dioxide, at a temperature of

between about 100° C. and 250° C., a reaction medium which comprises:

(a) a sulfurized alkylphenate of an alkaline-earth metal of a TBN of between 0 and 170, the said alkylphenate bearing one or more C_6–C_{60} alkyl substituents;

(b) an alkaline-earth metal alkylbenzene sulfonate of a molecular weight of more than 300 and a TBN of less than or equal to 150;

(c) an alkaline-earth metal compound; and

(d) an alkylene glycol;

in a dilution oil in accordance with the following quantities of reagents:

(a) from about 5 to 60 parts by weight of sulfurized alkylphenate for 100 parts by weight of mixture of sulfurized alkylphenate plus alkylbenzene sulfonate;

(b) from about 40 to 95 parts by weight of alkylbenzene sulfonate for 100 parts by weight of mixture of sulfurized alkylphenate plus alkylbenzene sulfonate;

(c) from about 3 to 30 parts by weight of alkaline-earth metal compound for 100 parts by weight of a mixture of sulfurized alkylphenate plus alkylbenzene sulfonate;

(d) from 4 to 60 parts by weight of alkylene glycol for 100 parts by weight of mixture of sulfurized alkylphenate plus alkylbenzene sulfonate; and

(e) the amount of carbon dioxide necessary for the carbonation being between that which can be completely absorbed by the reaction medium and an excess of 30 percent of said amount;

(2) removing the alkylene glycol; and

(3) separating the superalkalinized metallic detergent-dispersant composition thus obtained.

4,412,928

CORROSION INHIBITORS FOR BORON-CONTAINING LUBRICANTS

Richard A. Holstedt, Whittier, Calif., and Peter Jessup, Millington, N.J., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 319,073, Nov. 9, 1981, and a continuation-in-part of Ser. No. 329,385, Dec. 10, 1981. This application Dec. 23, 1981, Ser. No. 333,998

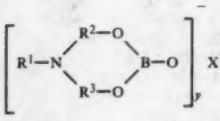
The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.³ C10M *1/20, 1/32, 1/38, 1/54*

U.S. Cl. 252—46.4 **26 Claims**

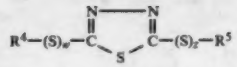
1. A lubricating composition comprising a major amount of a lubricating oil and a minor amount of:

(A) An extreme pressure, anti-wear and friction reducing boron compound of the formula:



wherein R^1 is hydrogen, alkyl, cyclic, alicyclic, aryl, alkylaryl, or arylalkyl radicals having from 1 to about 24 carbon atoms, R^2 and R^3 are the same or different, straight or branched carbon chains, cyclic, alicyclic, aryl, alkylaryl or arylalkyl radicals having from 2 to about 20 carbon atoms, y is a number from 1 to 4, and X is either hydrogen, a transition metal having an atomic number between 21 and 30 or a Group IVA metal of the Periodic Table and mixtures thereof;

(B) A copper corrosion inhibitor comprising a hydrocarbon polysulfide derivative of 2,5-dimercapto-1,3,4-thiadiazole having the formula



wherein R^4 and R^5 are moieties selected from hydrogen or straight or branched chain alkyl, cyclic, alicyclic, aryl, alkylaryl or arylalkyl radicals having from 2 to about 30 carbon atoms, provided that R^4 and R^5 are not both hydrogen and w and z are numbers from 1 to about 8; and

(C) a lead corrosion inhibitor comprising terephthalic acid.

4,412,929

MAGNETIC WALL COVERING COMPOSITION

Paul D. Lysenko, and Natalie Lysenko, both of 214 Hungerford St., Pittsfield, Mass. 01201

Filed Mar. 10, 1982, Ser. No. 356,968

Int. Cl.³ H01F *10/02*

U.S. Cl. 252—62.53 **1 Claim**

1. A magnetic coating composition consisting of 100 parts by weight of magnetic iron oxide particles, 60–90% of which pass 325 mesh, and 15–25 parts of weight of glue.

4,412,930

HEAT-STORING COMPOSITION

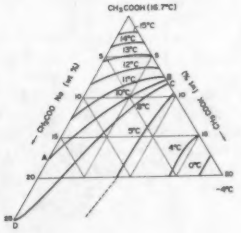
Keiichi Koike, Matsudo, and Michio Yanadori, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Plant Engineering and Construction Co., Ltd., both of Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,921

Claims priority, application Japan, Mar. 13, 1981, 56-35192

Int. Cl.³ C09K *3/18*

U.S. Cl. 252—70 **9 Claims**



1. A heat-storing composition which comprises acetic acid and one of ammonium acetate and calcium acetate in an amount sufficient to cause the melting point of the composition to be lower than that of acetic acid.

4,412,931

REVERSIBLE PHASE CHANGE COMPOSITIONS OF CALCIUM CHLORIDE HEXAHYDRATE WITH A POTASSIUM SALT

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 13, 1982, Ser. No. 417,275

Int. Cl.³ C09K *5/06*

U.S. Cl. 252—70 **31 Claims**

1. A reversible liquid/solid phase change composition comprising an admixture of hydrated $CaCl_2$ and a potassium salt whose anion forms a substantially less soluble salt with calcium, wherein the potassium salt is added in an amount sufficient to modify the semi-congruent melting behavior of $CaCl_2.6H_2O$ to the extent that the mixture approaches the congruent melting behavior of a congruently melting mixture and to reduce, during retrieval of the stored heat by crystalliza-

tion of the mixture, the formation of crystalline $CaCl_2$ hydrate phases other than $CaCl_2.6H_2O$.

4,412,932

METHOD OF CLEANING FIBREGLASS

Barry R. Howson, 21 Rochdale Rd., Mount Claremont, Western Australia, Australia

Continuation of Ser. No. 208,573, Nov. 20, 1980, Pat. No. 4,324,678. This application Jan. 7, 1982, Ser. No. 337,822

Claims priority, application Australia, Nov. 23, 1979, PE1455

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.³ B60S *1/00*; B63B *59/00*; C11D *7/08, 7/26*

U.S. Cl. 252—136 **1 Claim**

1. A method of cleaning stains from fibreglass by simply applying a chemical solution without the necessity of scrubbing or removing the residue by washing it off, or the like, which consists of the single step of applying to a fibreglass surface an aqueous solution consisting of (1) water, (2) about 0.25% to 1.0% by weight of a particulate material of the group consisting of ferrous sulphate and ferrous ammonium sulphate expressed as $FeSO_4$, (3) acid of a pH between 0.5 and 2 containing 20 to 55 percent W/W of acid from the group consisting of phosphoric and oxalic acid and (4) 0.1 to 3 percent by weight of a non-ionic detergent, and letting the solution dry on the fibreglass surface without washing off.

4,412,933

COLOR STABILIZED NONIONIC SURFACTANTS

Erhard Klahr; Wolfgang Trieselt; Wolf-Dieter Balzer, all of Ludwigshafen; Rainer Strickler, Heidelberg, and Dieter Stoeckigt, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,166

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018714

Int. Cl.³ C11D *17/00*

U.S. Cl. 252—174.19 **4 Claims**

1. A color-stabilized nonionic surfactant composition consisting of a nonionic surfactant which contains chemically bonded polyalkylene oxide groups having terminal hydroxyl groups and in which is dissolved 0.1 to 5% by weight of a color stabilizing additive selected from the group consisting of C_1–C_4 alkyl esters of C_4–C_8 alkyl dicarboxylic acids, mixtures thereof, and a mixture of C_4–C_8 alkyl dicarboxylic acids.

4,412,934

BLEACHING COMPOSITIONS

Stanley Y. Chung, Cincinnati, and Gianfranco L. Spadini, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 393,843, Jun. 30, 1982, abandoned. This application Mar. 7, 1983, Ser. No. 472,683

Int. Cl.³ D06L *3/02*; C11D *3/395, 7/54*

U.S. Cl. 252—186.38 **22 Claims**

1. A bleaching composition comprising:

(a) a peroxygen bleaching compound capable of yielding hydrogen peroxide in an aqueous solution; and

(b) a bleach activator having the general formula:

wherein R is an alkyl group containing from about 5 to about 18 carbon atoms wherein the longest linear alkyl chain extending from and including the carbonyl carbon contains from about 6 to about 10 carbon atoms and L is a leaving group, the conjugate acid of which has a pK_a in the range of from about 6 to about 13;

wherein the molar ratio of hydrogen peroxide yielded by (a) to bleach activator (b) is greater than about 1.5.

4,412,935

STORAGE MATERIAL FOR HYDROGEN UTILIZING AMORPHOUS SILICON AND A METHOD FOR PRODUCING THE SAME

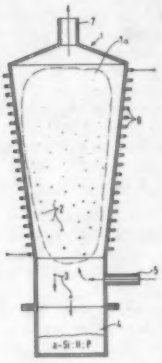
Rolf Plaettner, Ottobrunn, and Wolfgang Krüehler, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 356,231

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3110290

Int. Cl.³ C01B *33/04*; B01J *20/10*

U.S. Cl. 252—188.1 **10 Claims**



1. A storage material for hydrogen comprised of amorphous silicon containing phosphorous, in addition to hydrogen.

4,412,936

PIGMENT FOR COLOR-CHANGING HEAT INDICATOR

Stanislav F. Khmelkov, prospekt Lenina, 39, kv. 34; Mnaidar R. Ramazanov, ulitsa Lermontova, 7; Mikhail P. Soldatov, ulitsa Gogolya, 71, kv. 2; Vadim V. Beskaravainy, ulitsa Solnechnaya, 3, kv. 2; Viktor L. Aranovich, ulitsa Gogolya, 61, kv. 2, and Lev K. Soldaev, ulitsa Kommunalnaya, 2, kv. 2, all of Almalyk, U.S.S.R.

Filed May 7, 1981, Ser. No. 261,638

Claims priority, application U.S.S.R., Jun. 20, 1980, 2932951

Int. Cl.³ C01K *11/14*; C09K *3/00*; C01G *3/00, 3/04, 13/00, 13/04*

U.S. Cl. 252—408.1 **7 Claims**

1. A method of producing a pigment for a color-changing heat indicator which comprises:

(a) mixing an aqueous solution containing ions of bivalent copper and mercury with an aqueous solution of a nitrogen containing compound selected from the group consisting of an amide of carbonic or thiocarbonic acid, and a tertiary amine in an amount equal to 0.8–8.0% of the total content of copper and mercury, and

(b) adding to the resulting mixture, an aqueous solution containing iodine ions to thereby form a pigment wherein the atomic ratio of Cu:Hg:I in said pigment is 2:1.5:3–5.

7. The product produced by the process of claims **1**, **2**, **3**, **4**, **5** or **6**.

4,412,937

METHOD FOR MANUFACTURE OF ACTIVATED CARBON FIBER

Shigeru Ikegami, Mishima; Minoru Hirai, Shizuoka; Kazuo Izumi, Shizuoka, and Kenji Shimazaki, Shizuoka, all of Japan, assignors to Toho Belson Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1982, Ser. No. 371,164

Claims priority, application Japan, Apr. 23, 1981, 56-61646; May 13, 1981, 56-72067

Int. Cl.³ B01J *37/28, 37/00;* D01F *9/12*

U.S. Cl. 502—423 23 Claims

1. A method for manufacturing acitivated carbon fiber, comprising the steps of:

(1) causing an acrylic fiber to contain therein a treating agent, wherein the treating agent is selected from the group consisting of phosphorus and boron compounds in a concentration of 0.01 to 0.3% by weight as phosphorus, boron, or a mixture thereof, based on the weight of the fiber;

(2) preoxidizing the acrylic fiber in an oxidizing atmosphere at a temperature exceeding 200° C. and giving a core ratio of not more than 18% until the amount of bonded oxygen becomes not less than 15% by weight based on the weight of fiber thereby producing a preoxidized fiber;

(3) adjusting the concentration of the treating agent in the preoxidized fiber to a level in the range of 0.04 to 1% by weight based on the thus obtained preoxidized fiber; and

(3) activating the fiber at a temperature in the range of 900° to 1,300° C., until said activated carbon fiber has a specific surface area of not less than 300 m^2/g.

4,412,938

SEMICONDUCTING RESIN COMPOSITIONS

Tetsuji Kakizaki, and Toshikazu Mizutani, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Oct. 20, 1980, Ser. No. 198,922

Claims priority, application Japan, Oct. 29, 1979, 54-139492

Int. Cl.³ H01B *5/16;* C08K *3/04*

U.S. Cl. 252—511 4 Claims

1. A semiconducting resin composition useful as a semiconducting layer of an insulated electric cable comprising:

(A) 100 to 40 parts of a modified ethylene-vinyl acetate copolymer which is a product of graft processing of 100 parts of an ethylene-vinyl acetate copolymer of a vinyl acetate content of less than 35 percent with 25 to 200 parts of an aromatic vinyl monomer;

(B) 0 to 60 parts of a rubber; and

(C) 3 to 150 parts of an electrically conductive carbon black selected from the group consisting of furnace black, acetylene black, and ketjen black with respect to 100 parts of the above described components (A) and (B), all quantities in "parts" and "percent" being by weight.

4,412,939

REACTION PRODUCTS OF TRANSITION METAL COMPOUNDS AND BORON COMPOUNDS AND CATALYSTS PREPARED THEREFROM

Randall S. Shipley, Alvin, and Larry E. Freyer, Richwood, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1982, Ser. No. 353,301

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—115 13 Claims

5. The catalytic reaction product of

(A) the reaction product or complex formed from the admixture of

(1) at least one transition metal compound represented by the empirical formulae $Tm(OR)_yX_{x-y}$ or $Tm(OR)_{x-2}O$, wherein Tm is a transition metal selected from groups IVB, VB or VIB; each R is independently a hydrocarbyl group, having from 1 to about 20 carbon atoms; each X is independently a halogen; x has a value equal to the valence of Tm and y has a value from 1 to the valence of Tm; and

(2) at least one boron compound represented by the empirical formula BX_3 wherein X is a halogen; and

(B) a magnesium halide resulting from the reaction of

(1) an organomagnesium compound represented by the empirical formula $MgR''_2.xMR''_y$ wherein M is aluminum or zinc, each R'' is independently a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, x has a value from zero to 10 and y has a value corresponding to the valence of M; with

(2) a halide source selected from

(a) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or a hydrocarbyl group such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen or

(b) a metallic halide corresponding to the empirical formula $MR_{y-a}X_a$ wherein M is a metal of Group IIB, IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl radical, X is halogen, y is a number corresponding to the valence of M and a is a number from 1 to y; and

(C) when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, an aluminum compound represented by the empirical formula $AlR_{y'}X_{y''}$ wherein R and X are as defined above, y' has a value of 2 or 3 and y'' has a value of zero or one with the sum of y' and y'' being three; and

wherein the components are employed in quantities which provide an atomic ratio of the elements Mg:Tm of from about 1:1 to about 200:1; B:Tm at least about 0.1:1; Al:Tm of from about 0.1:1 to about 200:1 and an excess X:Al of from about 0.0005:1 to about 5:1.

4,412,940

METHOD FOR PREPARING MALEIC ANHYDRIDE CATALYST

Ramon A. Mount, and Harold Raffelson, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1980, Ser. No. 217,731

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—209 5 Claims

1. In a method for the preparation of a phosphorus-vanadium-oxygen-containing complex catalyst comprising:

(a) contacting vanadium and phosphorus compounds under conditions which will provide a catalyst precursor wherein greater than 50 atom % of the vanadium is in the tetravalent state;

(b) recovering the catalyst precursor;

(c) forming the catalyst precursor into agglomerates; and

(d) calcining the catalyst precursor agglomerations at a temperature between about 300° C. and 600° C.

the improvement consisting essentially of calcining in one temperature range at 325°–375° C. the catalyst precursor in the presence of a 0.1–1.5 mole percent concentration of a saturated aliphatic hydrocarbon in air.

4,412,941

RECORDING DISC COMPOSITIONS COMPRISING POLYMERS OF MONOVINYL-SUBSTITUTED HYDROCARBONS, CONDUCTIVE CARBON BLACK AND LUBRICANTS

Nicolas J. Probst, Brussels; Jean Iker, Overijse, and Jacques Autin, Brussels, all of Belgium, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 22, 1981, Ser. No. 313,928

Int. Cl.³ C08K *3/04*

U.S. Cl. 252—511 57 Claims

1. A conductive molding composition comprising

(a) from about 65 to 85 weight percent of a resin component selected from the group consisting of

(1) a normally solid, resinous block copolymer of a monovinyl-substituted aromatic hydrocarbon containing from 8 to 12 carbon atoms per molecule and a minor amount of at least one conjugated alkadiene containing from 4 to 8 carbon atoms per molecule, and one or more optional modifying polymers selected from the group consisting of

(A) a normally solid resinous homopolymer of a monovinyl-substituted aromatic hydrocarbon, and

(B) a normally solid, elastomeric copolymer of a major amount of at least one conjugated alkadiene containing from 4 to 8 carbon atoms per molecule and a minor amount of a monovinyl-substituted aromatic hydrocarbon containing from 8 to 12 carbon atoms per molecule and,

(2) a normally solid, resinous homopolymer of a monovinyl-substituted aromatic hydrocarbon and one or more modifying polymers selected from the group consisting of

(A) elastomeric copolymers, as defined above, and

(B) normally solid resinous block copolymers as defined above,

(b) from about 10 to 30 weight percent of finely divided extra-conductive carbon black particles, and

(c) from about 1 to 5 weight percent of at least one lubricant, wherein said carbon black and lubricant are uniformly dispersed within said composition.

4,412,942

PREPARATION OF ELECTRICALLY CONDUCTIVE POLYMERS

Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal; Johannes Schlag, and Petr Simak, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,158

Claims priority, application Fed. Rep. of Germany, May 11, 1981, 3118630

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—518 **4 Claims**

1. A process for the preparation of a stable electrically conductive polymer from a polyacetylene, the polymer having an electrical conductivity greater than 10^{-2} S/cm, which process consists essentially of treating the polyacetylene with from 1 to 100% by weight of tosylmethyl isocyanide and from 0.1 to 70% by weight of a dopant selected from the group consisting of an alkali metal, an alkali metal amide or a Lewis acid, the percentages being based on the polyacetylene.

4,412,943

LIQUID DETERGENT COMPOSITION

Hajime Hirota, Tokyo, and Hiroshi Watanabe, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,675

Claims priority, application Japan, Feb. 23, 1981, 56-25257; Jan. 8, 1982, 57-1604

Int. Cl.³ C11D *1/38, 3/26*

U.S. Cl. 252—546 **9 Claims**

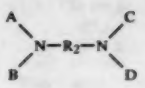
1. A liquid detergent composition which consists essentially of:

(A) from 5 to 25 wt. % of an ammonium alkyl sulfate having the formula

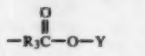
$$R_1OSO_3NH_4$$

wherein R_1 is alkyl having from 8 to 18 carbon atoms on the average,

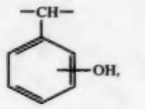
(B) from 0.05 to 5 wt. % of one or a mixture of two or more alkylenediaminecarboxylic acid derivatives having the formula



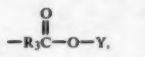
wherein R_2 is alkylene having 2 or 3 carbon atoms; A, B, C and D, which are the same or different, each is



or hydrogen, in which R_3 is $-C_nH_{2n}-$ or



n is 1 or 2 and Y is hydrogen or a cation, with the proviso that from 0 to 2 of the groups, A, B, C and D are hydrogen and the remainder are



(C) from 0.1 to 5 wt. % of one or a mixture of two or more compounds selected from the group consisting of carboxylic acids selected from the group consisting of lower fatty acids having from 1 to 8 carbon atoms, dicarboxylic acids having the formula $HOOC-(-CH_2-)_n-COOH$ wherein n is an integer of from 0 to 5, glycolic acid, lactic acid, hydroacrylic acid, α-hydroxybutyric acid, β-hydroxybutyric acid, glyceric acid, tartronic acid, malic acid, tartaric acid, citric acid, maleic acid, fumaric acid, mesaconic acid and citraconic acid, and amino acids selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, phenylalanine, tryptophane, sarcosine, β-alanine, γ-aminobutyric acid, ε-aminocaproic acid, glutamic acid, aspartic acid, cysteic acid, homocysteic acid, lysine, ornithine, arginine, serine, homoserine, tyrosine, threonine, proline, hydroxyproline, cystine, cysteine and methionine, and salts of said carboxylic acids and said amino acids, and

(D) the balance is essentially water.

4,412,944

HIGH FOAMING, LOW EYE IRRITATION CLEANING COMPOSITIONS CONTAINING ETHOXYLATED ANIONIC (C13-C30) SULPHATES

George W. Panzer, Timonium, and Louis J. Nehmsmann, Ellicott City, both of Md., assignors to Alcolac, Inc., Baltimore, Md.

Continuation of Ser. No. 120,762, Feb. 12, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,369

Int. Cl.³ C11D *1/29*

U.S. Cl. 252—551 **2 Claims**

1. A high foaming, low eye irritation cosmetic cleaning composition comprising an alkyl ether sulphate consisting essentially of a mixture of 60% sodium myristyl ether (12) sulphate and 40% sodium cetyl ether (12) sulphate.

2. A high foaming, low eye irritation cosmetic cleaning composition comprising an alkyl ether sulphate consisting essentially of a mixture of 65% sodium cetyl ether (12) sulphate and 35% sodium stearyl ether (12) sulphate.

4,412,945

AQUEOUS HIGH CONCENTRATION SLURRY OF ALCOHOL ETHOXYLATE

Masatoshi Takahashi, Fujisawa; Mituo Sugiyama, Tokyo; Osamu Toisawa, Chiba, and Yasuo Ishizaki, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 336,827

Int. Cl.[3] C11D *1/831, 1/14*

U.S. Cl. 252—551 5 Claims

1. An aqueous high concentration slurry of an alcohol ethoxysulfate comprising:

(a) at least 50% by weight based on the weight of the slurry of a higher alcohol ethoxysulfate and

(b) 0.05 to 10% by weight based on the weight of the slurry of a polyoxyethylene alkyl ether having an average molecular weight of about 4,000 to about 10,000, the alkyl group of said ether having 8 to 16 carbon atoms.

4,412,946

IMMUNOSTIMULATING GLYCOPROTEINS

René Zalisz, Saint Ouen l'Aumone, and Marie-France Salles, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Sep. 10, 1981, Ser. No. 300,910

Claims priority, application France, Sep. 19, 1980, 80 20188

Int. Cl.[3] A61K *37/02, 39/108, 39/40;* C07G *7/00*

U.S. Cl. 260—112 R 2 Claims

1. A process for the preparation of a water-soluble immunostimulating glycoprotein extracted from *Klebsiella pneumoniae* containing 30 to 45% by weight of proteins, 30 to 40% by weight of neutral saccharides, up to 4% by weight of glucuronic acid, 2 to 5% by weight of osamines and having a molecular weight of about 350,000 daltons comprising treating a solution of glycoproteins obtained by diafiltration of an extract of a lysate of *Klebsiella pneumoniae* culture with a quaternary ammonium compound, isolating a surnageant by removal of the resulting precipite, treating surnageant corresponding to a saline solution of glycoproteins in the cold with a lower molecular weight alkanol, recovering the resulting precipitate, dissolving the precipitate in water and subjecting the resulting solution to dialysis and then lyophilysis, dissolving the product, filtering the solution through a gel, recovering the first eluted fraction and concentrating the eluant, optionally to dryness.

4,412,947

COLLAGEN SPONGE

Gheorghe Cioca, Coatesville, Pa., assignor to Seton Company, Newark, N.J.

Continuation-in-part of Ser. No. 184,536, Sep. 5, 1980, abandoned, and Ser. No. 190,372, Sep. 24, 1980, Pat. No. 4,374,121, which is a continuation-in-part of Ser. No. 74,738, Sep. 12, 1979, Pat. No. 4,279,812. This application May 26, 1982, Ser. No. 382,133

Int. Cl.[3] C07G *7/00;* C08H *1/06;* C08L *89/04, 89/06*

U.S. Cl. 260—123.7 9 Claims

1. A process of preparing a coherent, porous collagen sheet material comprising:

forming natural insoluble particulate collagen in substantially pure form;

suspending said particulate collagen in a weak aqueous organic acid solution while maintaining said collagen in particulate form; and

freeze-drying said suspension to form a coherent, porous native collagen sheet material.

4,412,948

REACTIVE DISAZO BLUE DYE

Takashi Omura, Ashiya; Yasuo Tezuka, Ibaraki, and Masaki Sunami, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

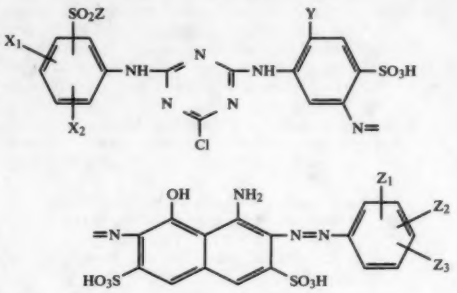
Filed Jun. 30, 1980, Ser. No. 164,243

Claims priority, application Japan, Jul. 6, 1979, 54-86349

Int. Cl.[3] C09B *31/047*

U.S. Cl. 260—153 4 Claims

1. A compound represented by a free acid of the formula,



wherein X_1 and X_2 are each a hydrogen atom, a methyl or methoxy group, a chlorine atom, or a carboxylic acid or sulfonic acid group, Y is a hydrogen atom, a methyl or sulfonic acid group, Z is $-CH_2CH_2OSO_3H$, $-CH_2CH_2OPO_3H_2$, $-CH_2CH_2Cl$ or $-CH=CH_2$, and Z_1, Z_2 and Z_3 are each a hydrogen or chlorine atom, a methyl, methoxy, sulfonic acid or carboxylic acid group.

4,412,949

PIGMENTS COMPRISING CYANOMETHYLQUINAZOLONES COUPLED TO DIAZO COMPOUNDS PREPARED FROM 1-AMINOANTHROQUINONES

Peter Dimroth, Mannheim, and Wolfgang Lotsch, Beindersheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

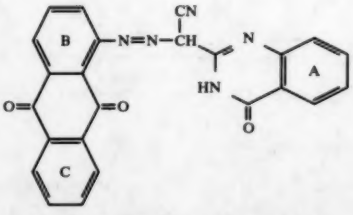
Filed Jul. 1, 1981, Ser. No. 279,542

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3024957

Int. Cl.[3] C09B *6/00, 29/52;* C09D *3/48, 11/02*

U.S. Cl. 260—154 3 Claims

1. A pigment of the formula



where ring A is unsubstituted or is substituted by halogen and ring B is unsubstituted or is substituted by chlorine.

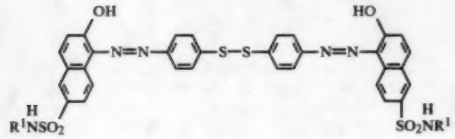
4,412,950

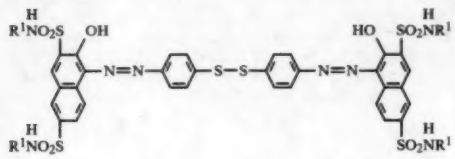
MONOAZO AND DISAZO COLORANTS

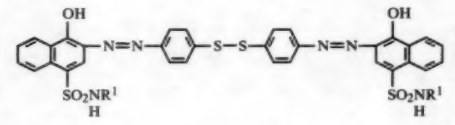
Nathan N. Crounse, Myrtle Beach, S.C., assignor to Sterling Drug Inc., New York, N.Y.

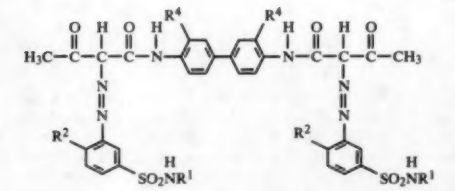
Division of Ser. No. 195,128, Oct. 8, 1980, Pat. No. 4,376,729. This application Mar. 24, 1982, Ser. No. 361,187
Int. Cl.³ C09B *46/00*
U.S. Cl. 260—157 19 Claims

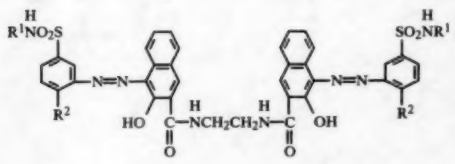
1. A disazo compound bearing (N-substituted sulfonamido) groups said disazo compound selected from the group consisting of



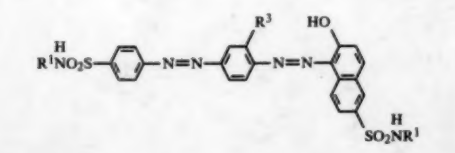






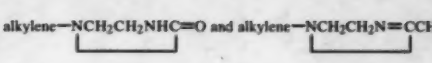


and



in which

R^1 represents a moiety selected from the group consisting of alkylene-NH-alkylene-NH_2, alkylene-N-(non-tertiary C_1 to C_{14} alkyl)$_2$,



in which alkylene represents $—CH_2CH_2—$ and $—CH_2CH_2CH_2—$,

R^2, R^3, and R^4 represent hydrogen, C_1–C_3 alkyl or C_1–C_3 alkoxy; or the acid-addition salt forms of said disazo compounds.

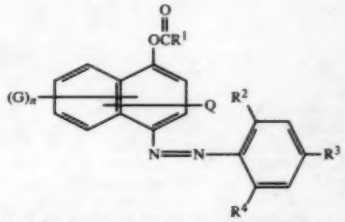
4,412,951

REAGENTS FOR MEASURING LIPASE ACTIVITY

Yoshio Inagaki; Masaki Okazaki, and Shinsaku Fujita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 28, 1981, Ser. No. 316,025
Claims priority, application Japan, Oct. 28, 1980, 55-151043
Int. Cl.³ C07C *107/08*
U.S. Cl. 260—202 15 Claims

1. A reagent for measuring a lipase activity comprising a higher fatty acid ester represented by the general formula



wherein R^1 represents an alkyl group having 9 to 17 carbon atoms; R^2 represents a hydrogen atom or a halogen atom; R^3 and R^4, which may be the same or different, each represents a nitro group, an alkylsulfonyl group having 1 to 8 carbon atoms, an alkylsulfonyl group having 1 to 8 carbon atoms substituted by a sulfo group or an alkoxy group, or a trifluoromethyl group; G represents $—SO_3M$ or an atomic group having at least one $—SO_3M$, where M represents sodium or potassium, or, when R^4 has a sulfonic acid group, may be a hydrogen atom; Q represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy-substituted alkyl group, an alkoxy group, an alkoxy-substituted alkoxy group, a sulfonamido group, a sulfamoyl group, a carbonamido group, a carbamoyl group, or an alkylsulfonyl group; the carbon atom number of these substitutents being 8 or less than 8; and n is an integer of 1 to 3.

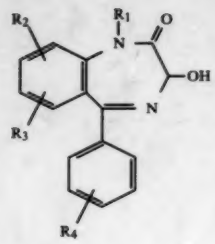
4,412,952

PROCESS FOR 3-HYDROXY BENZODIAZEPINONES

Goetz E. Hardtmann, Morristown; Oljan Repic, Hopatcong, and Susi Vogt, Chatham, all of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

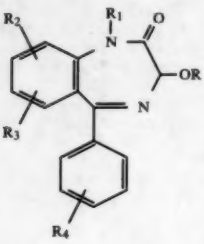
Filed Apr. 30, 1982, Ser. No. 373,450
Int. Cl.³ C07D *243/26*
U.S. Cl. 260—239.3 D 8 Claims

1. A process for preparing a compound of the formula:



(I)

from a compound of the formula:



(II)

where

R represents C_{2-8} alkanoyl, phenoyl, phenoyl substituted with a loweralkyl, fluoro or chloro moiety, phen C_{2-5} loweralkanoyl, or haloacyl,

R_1 represents C_{1-3} loweralkyl,

R_2 and R_3, independently, represent H, chloro, bromo, nitro, trifluoromethyl or methylsulfonyl, and

R_4 represents H, chloro, fluoro, methoxy, methyl or trifluoromethyl, which comprises treating the latter with potassium hydroxide or 1–3 carbon potassium alkoxide as catalyst in a reaction medium comprising C_{1-3} lower alkanol at a pH of 11 to 11.5.

4,412,953

PROCESS FOR PREPARING 16α-HYDROXY-17α-AMINOPREGNANE DERIVATIVES

Giorgio Winters, Milan, Italy, assignor to Gruppo Lepetit, S.p.A., Milan, Italy

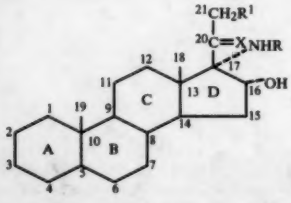
Filed Nov. 18, 1981, Ser. No. 322,485

Claims priority, application Italy, Nov. 26, 1980, 26229 A/80

Int. Cl.³ C07J *43/00*

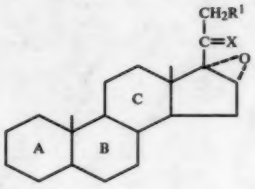
U.S. Cl. 260—239.5 **9 Claims**

1. A process for preparing 16α-hydroxy-17α-aminopregnane derivatives represented by the following general formula



(I)

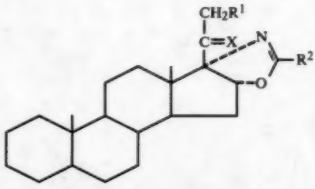
wherein R is hydrogen, alkyl, aralkyl; R^1 is hydrogen hydroxy, alkanoyloxy, or aroyloxy, X is O or an easily removable hydrazine or hydroxylamine protecting group for the carbonyl function, rings A, B, C of the pregnane skeleton may be substituted at the 3- and 11-positions with oxo, hydroxy, alkoxy, aralkoxy and acyloxy groups and bear one or more noncumulated double bond at the 1–2, 3–4, 4–5, 5–6, and 6–7, and 9–11 positions, charcterized in that a compound of formula



(II)

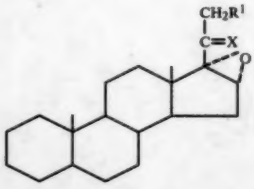
wherein R^1 has the same meanings as above, rings A, B, and C may be substituted and bear double bonds as described above, and X is a N-containing protecting group of the keto function which may be easily removed in order to restore the keto function itself, is contacted with an amine of formula RNH_2 wherein R is hydrogen, alkyl or aralkyl and, when a compound of formula I is desired wherein X is oxygen, the N-containing protecting group is removed to restore the keto function.

7. A process for the preparation of pregnano[17α,16α-d]oxazoline derivatives having the formula

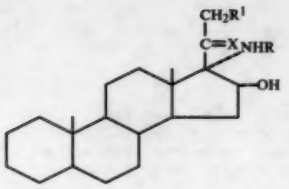


wherein R^1 is hydrogen, hydroxy, alkanoyloxy, aroyloxy, carboalkoxy or carboaralkoxy; R^2 is alkyl, aryl, or aralkyl; X is O or an easily removable protecting group of the carbonyl function, rings A, B, C are substituted at C-3 with an oxo, hydroxy, alkoxy, aralkoxy or acyloxy group, may be substituted at C-11 with a group selected from oxo, hydroxy and acyloxy, and may bear one or more non-cumulated double bonds at the 1–2, 3–4, 4–5 and 5–6 positions, which comprises:

(a) contacting a 16α,17α-epoxypregnane, having the formula



wherein R^1 and X are as described above with an amine of the formula RNH^2 wherein R is alkyl or aralkyl to form a 16α-hydroxy-17α-aminopregnane derivative having the formula



wherein R^1 and X are as described above and R is alkyl or aralkyl;

(b) treating said 16α-hydroxy-17α-aminopregnane derivative with a mixture of an anhydride having the formula $(R^2CO)_2O$, wherein R^2 is as defined above, and the corresponding acid;

(c) removing the carbonyl protecting group, if any; and

(d) isolating the desired pregnano[17α,16α-d]oxazoline derivative therefrom.

4,412,954

PROCESS FOR PRODUCING 1,4,4A,9A-TETRAHYDROANTHRAQUINONE COMPOUND

Tatsuyoshi Komatsu, Kamakura, and Kenji Usui, Nihonbashi, both of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Jul. 14, 1981, Ser. No. 283,174
Int. Cl.³ C07C *50/10*
U.S. Cl. 260—369 **2 Claims**

1. A process for producing a 1,4,4*a*,9*a*-tetrahydroanthraquinone compound which consists essentially of reacting by Diels-Alder reaction 1,4-naphthoquinone with a conjugated diolefin in 1,4,4*a*,9*a*-tetrahydroanthraquinone compound as a reaction medium in substantial absence of other organic solvent and wherein the amount of said tetrahydroanthraquinone is at a ratio of 0.5 to 5 parts by weight per part of naphthoquinone.

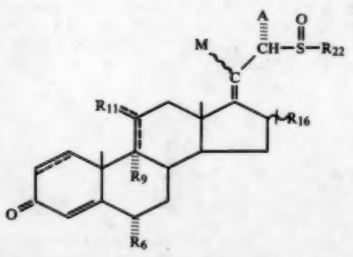
4,412,955

PREPARATION OF CORTICOIDS FROM 17-KETO STEROIDS

Jerry A. Walker, Oshtemo Township, Kalamazoo County, and Edward J. Hessler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 264,593, May 18, 1981, Pat. No. 4,257,279. This application May 17, 1982, Ser. No. 378,938
Int. Cl.³ C07J *7/00*
U.S. Cl. 260—397.45 **22 Claims**

1. A 20,21-dihalo steroid of the formula



(VII)

where A is a fluorine, chlorine or bromine atom; M is a fluorine, chlorine or bromine atom; R_6 is a hydrogen or fluorine atom or methyl group; R_9 is a hydrogen or fluorine atom, hydroxyl group, —OSi(R)₃ or nothing; R_{11} is (H), (H,H), (H, β—OSi(R)₃, or (O); R_{16} is a hydrogen atom or methyl group; R_{22} is alkyl of 1 thru 5 carbon atoms, trichloromethyl, phenyl, phenyl substituted with 1–4 carbon atoms or substituted with 1 thru 3 nitro or trifluoromethyl groups, aralkyl of 7 thru 12 carbon atoms or —N—$(R_{122})_2$ or phthalimide; ~ indicates the attached group can be in either the α or β configuration; is a single or double bond.

4,412,956

PROCESS FOR FORMING ALKYL VANADATES USING A CATALYST

Alan Abramson, White Plains; George C. Clomo, Hastings-on-Hudson; Gershon J. Davis, White Plains, and Edward D. Weil, Hastings-on-Hudson, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 27, 1981, Ser. No. 287,390
Int. Cl.³ C07F *9/00*
U.S. Cl. 260—429 R **8 Claims**

1. In a process for the formation of alkyl vanadates by the reaction of an alkyl alcohol and vanadium pentoxide in an azeotroping solvent, wherein the improvement comprises the use of a catalytically effective amount of a basic nitrogenous catalyst to increase the yield of product.

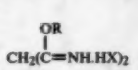
4,412,957

PROCESS FOR PREPARING DIALKYL PROPANEDIIMIDATE DIHYDROHALIDES

Jeffrey S. Gramm, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 15, 1982, Ser. No. 388,625
Int. Cl.³ C07C *119/055*
U.S. Cl. 260—453.7 **16 Claims**

1. An improved process for preparing a dialkyl propanediimidate dihydrohalide of the formula:



where

R is alkyl of 1 to 3 carbon atoms, and

X is chlorine or bromine, by reacting malononitrile, an alcohol ROH and anhydrous hydrogen halide HX, wherein the improvement comprises conducting the reacton in a chlorofluorocarbon solvent having a boiling point in the range of about −45° to 100° C.

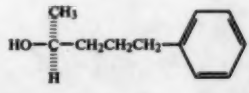
4,412,958

STEREOSPECIFIC SYNTHESIS OF 5-PHENYL-2S-PENTANOL

Berkeley W. Cue, Jr., Gales Ferry, and Bernard S. Moore, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 312,012, Oct. 16, 1981, abandoned. This application Aug. 5, 1982, Ser. No. 404,075
Int. Cl.³ C07C *137/00, 29/132, 49/213*
U.S. Cl. 260—456 R **17 Claims**

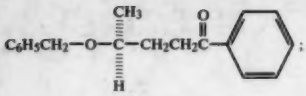
5. A process for the preparation of a 2S chiral alcohol of the formula



(I)

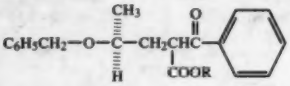
which comprises:

(a) hydrogenation over a noble metal catalyst of a chiral ketone of the formula



(II)

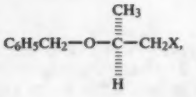
(b) preparation of the chiral ketone of the formula (II) by hydrolysis and decarboxylation of a chiral ester of the formula



(III)

wherein R is (C_1–C_4)alkyl;

(c) preparation of the chiral ester of the formula (III) by reaction of an alkali metal salt of a (C_1–C_4)alkyl benzoylacetate with chiral compound of the formula



(IV)

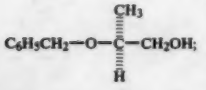
wherein X is I, Br, Cl, OSO_2CH_3 or

optionally in the presence of iodide ion;

(d) when X is I, Br or Cl, preparation of the chiral halide compound of the formula (IV) wherein X is I, Br or Cl by reaction of halide ion with a sulfonate ester compound of the formula (IV) wherein X is OSO_2CH_3 or

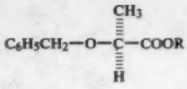
(e) formation of the sulfonate ester of the formula (IV) wherein X is OSO_2CH_3 or

by reaction of methanesulfonyl chloride or p-toluene sulfonyl chloride with a chiral compound of the formula



(V)

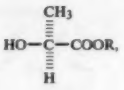
(f) formation of the chiral compound of the formula (V) by hydride reduction of a chiral ester of the formula



(VI)

wherein R is (C_1–C_4)alkyl; and

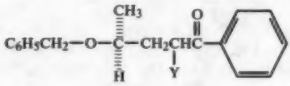
(g) preparation of the chiral ester of the formula (VI) by reaction of benzyl methanesulfonate neat with an excess of a chiral 2S lactate ester of the formula



(VII)

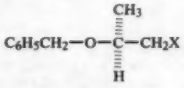
wherein R is (C_1–C_4)alkyl.

11. A chiral ketone of the formula



wherein Y is hydrogen or —COOR and R is (C_1–C_4)alkyl.

15. A chiral compound of the formula



wherein X is I, Br, Cl or OSO_2CH_3.

4,412,959

PROCESS FOR THE PRODUCTION OF MICROCAPSULES

Christian Wegner, Cologne; Gert Jabs, Odenthal, and Manfred Dahm, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

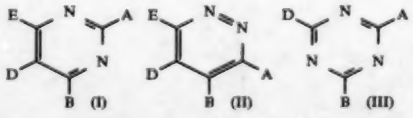
Filed Jun. 8, 1981, Ser. No. 271,607

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022453

Int. Cl.³ B01J *13/02*

U.S. Cl. 264—4.1 **6 Claims**

1. A process for the production of microcapsules by interfacial polyreaction, which comprises mixing a first reactant with an emulsion of a solution of a material to be encapsulated and a second reactant whereby the first and second reactants react to form a capsule containing the said material and wherein the second reactant dissolved in the disperse phase is a nitrogen-containing heterocyclic compound corresponding to one of the formulae (I), (II) or (III):



wherein at least two of the radicals A, B, D and E are halogen atoms, ammonium, hydrazinium, sulfonium, optionally substituted alkyl sulfonyl, aryl sulfonyl, aralkyl sulfonium, azido, aryloxy, thiocyano arylthio and sulfonic acid residues which are reactive under the conditions of the capsule-forming reaction and the remaining radicals A, B, D, E are hydrogen, alkyl, aryl, alkoxy, phenoxy, alkylamino or phenylamino radicals

which are not reactive under the conditions of the capsule-forming reaction.

4,412,960

METHOD FOR PROCESSING A STRIP OF POLYMER MATERIAL BY ELECTRICAL DISCHARGE

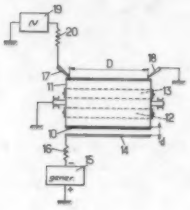
Alice Goldman, and Daniel Le Fur, both of Gif Sur Yvette, France, assignors to Electricite De France, Paris, France

Filed Mar. 9, 1981, Ser. No. 241,644

Claims priority, application France, Mar. 11, 1980, 80 05441

Int. Cl.³ H01T *19/04;* **B01J** *19/12*

U.S. Cl. 264—22 **5 Claims**



1. Method for processing dielectric polymer material in strip form by electrical discharge, comprising circulating a strip of polymer material of predetermined width along a path for passing it successively at a first location and at a second location, depositing electrical charges on one surface of the strip as it passes at said first location and maintaining a sliding arc transversal to said path, throughout said width along said surface of the strip between electrodes subjected to an alternating high voltage at said second location.

4,412,961

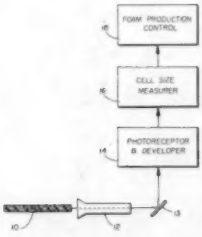
METHOD AND APPARATUS FOR MEASUREMENT AND CONTROL OF CELL SIZE IN A FOAM STRUCTURE

Daniel J. DiBiasi, and Charles M. Krutchen, both of Pittsford, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1981, Ser. No. 334,093

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—40.1 **9 Claims**



1. A method for monitoring the average cell size of a plastic foam structure continuously emerging from a production extrusion source which comprises:

presenting a cross-section of an area of said structure of the in-line extruded product to an optical projection means capable of projecting a magnified image of said area;

projecting a magnified image of said area through said means to a photoreceptor device to form thereon a latent image of said area;

developing said image to form a visible image of said area;

determining the average cell size of said area from said visible image by comparison with a known standard representing exceptable cell size limits; and

in response to said size, controlling process parameters to obtain a foam structure at least generally corresponding to said known standard.

4,412,962

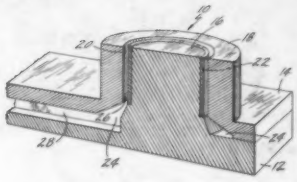
METHOD OF MOLDING A MECHANICALLY FROTHED URETHANE RESIN FOAM AND AN OPEN-TOP INJECTION MOLD THEREFORE

Michael D. Bessette, Storrs, Conn., and Robert B. Jerard, Hanover, N.H., assignors to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 175,319, Aug. 4, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 412,507

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—46.4 **35 Claims**



1. A method of molding products comprised of a foam material comprising the steps of:

delivering an uncured foam to a runner about the base of a mold cavity, the foam separating into a pair of oppositely flowing streams upon flow into the runner;

directing the uncured foam from the runner into the mold cavity through an opening of reduced cross-sectional area when compared to the runner whereby a back pressure is exerted on the foam material thereby causing the foam material to substantially completely fill the runner before beginning to flow through the restriction into the mold cavity;

allowing the mold cavity to fill with the foam material; and curing the foam.

4,412,963

METHOD OF PRODUCING DISCHARGE LAMP ARC TUBES

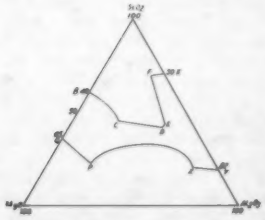
Peter Hing, 13, Malling Close, Birstall Leicester, England

Filed Dec. 18, 1981, Ser. No. 331,990

Claims priority, application United Kingdom, Dec. 20, 1980, 8040905

Int. Cl.³ C04B *35/64*

U.S. Cl. 264—61 **8 Claims**



1. A method of producing an arc tube for a discharge lamp which method comprises forming an assembly of one sintered cermet end closure member hermetically sealed to a ceramic arc tube of polycrystalline alumina, sapphire or a spinel by means of the following steps:

providing an arc tube in the incompletely fired state, provid-

ing an end closure member in the incompletely fired state complete with an electrode assembled thereto,

applying a layer of sealing composition between said end closure member and said arc tube and sintering the assembled arc tube and end closure complete with electrode at a temperature of from 1800° C. to 1900° C. in a vacuum, inert gas or a hydrogen atmosphere wherein said sealing composition comprises silica, alumina and magnesia in proportions such that said composition falls between the area BCDEFXYZPQ on the accompanying ternary phase diagram.

4,412,964

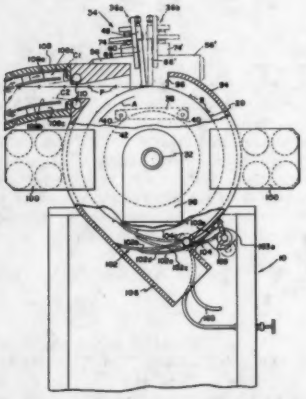
CENTRIFUGAL PELLETIZING SYSTEMS AND PROCESS

David B. Todd, Saginaw, and James D. Layfield, Bay City, both of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Feb. 16, 1982, Ser. No. 348,734

Int. Cl.³ B28B *11/16*

U.S. Cl. 264—143 **5 Claims**



1. In a method for forming pellets of thermoplastic material by centrifugally expressing strands of flowable thermoplastic material from orifices in the rim portion of a rotating hollow rotor bounded radially by a non-rotating housing chamber and severing said strands at a selected location adjacent the periphery of said rotor to form pellets; the steps of:

a. supplying said material to said rotor and initially positioning cutter means adjacent the rotor at a first peripheral location in which the cutter means extends across the path of rotation of strands extruded from the rotor and functions during start-up of the pelletizer to sever extruded scrap material;

b. removing the cutter means from said first location and positioning cutter means at a second peripheral location across the path of rotation of portions of said strands which have extruded from said rotor and are carried with the rotor in the path of revolution thereof;

c. moving pellets cut from said strand portions at said second location in a path tangential to the path of revolution of said rotor across and out of the chamber;

d. cooling the tangentially moved pellets severed from said strands before they agglomerate; and

e. collecting the pellets separately from the initially severed scrap material.

4,412,965

METHOD OF MAKING AN AIR SPRING

Donald R. Thompson, Wadsworth, and Robert H. Vogliano, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 8, 1981, Ser. No. 299,762

Int. Cl.³ B29D *3/02*; B29H *3/08*

U.S. Cl. 264—257 **3 Claims**

1. A method for making an air spring comprising, spreading a fabric around a core having a desired air spring shape, overlapping ends of said fabric in an axially extending region of said core, anchoring the overlapping ends of said fabric to said core, placing the core and fabric in a mold, injecting an elastomeric material in said mold and curring said material in said mold to form an air spring having a fabric reinforcement.

4,412,966

NECK ORIENTING METHOD OF BOTTLES OF SATURATED POLYESTER RESINS

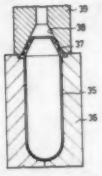
Yataro Yoshino; Sadao Suzuki, and Takuzo Takada, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 92,428, Nov. 7, 1979, Pat. No. 4,297,306.

This application Jun. 4, 1981, Ser. No. 270,291

Int. Cl.³ B29C *17/02, 17/07*

U.S. Cl. 264—521 **7 Claims**



1. A method of forming the neck portion of a synthetic resin bottle, the method comprising the steps of:

(a) forming a parison of synthetic resin, the parison having a neck and a body and capable of being further formed into a bottle;

(b) heating at least a portion of the neck to a temperature sufficent to permit molding thereof;

(c) pressing the heated neck portion into a tapered shape converging inwardly in a direction away from the body of the parison;

(d) further heating the tapered neck portion of the parison to an orientable temperature; and

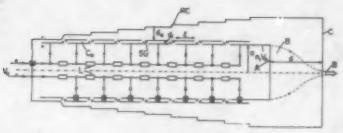
(e) operating on the tapered neck portion at the orientable temperature by means of an orienting device inserted into the neck portion of the parison to outwardly expand the neck portion from its inwardly converging shape so as to achieve orientation within the neck portion.

4,412,967

MULTISTAGE HIGH VOLTAGE ACCELERATOR FOR INTENSE CHARGED PARTICLE BEAMS

Friedwardt M. Winterberg, P.O. Box 11661, Reno, Nev. 89510

Filed Apr. 9, 1980, Ser. No. 138,602
Int. Cl.³ G21B *1/02*
U.S. Cl. 376—106 **1 Claim**



1. A method of achieving charged particle beams of at least 10^7 volts using conductors in stages and wherein breakdown is prevented by magnetic self-insulation comprising:

concentrically arranging a plurality of axially alligned vacuum insulated identical cylindrical capacitors inside a conductive vessel and coaxial therewith, said vessel serving as a common return current conductor for said capacitors, said cylindrical capacitors being comprised of inner and outer cylindrical conductors wherein said vessel together with said axially alligned outer cylindrical conductors comprises a multi-stage transmission line, connecting said plurality of cylindrical capacitors in series by means of triggered spark gap switches;

placing a charged particle beam producing diode means at one end of said transmission line, said diode means serving to produce a charge particle beam of at least 10^7 volts;

matching the impedance of said transmission line to that of said diode means such that electrons emitted from the cathode of said diode means are prevented from crossing the cathode—anode gap so as to insure magnetic self-insulation;

charging said cylindrical capacitors in parallel by means of a central axially arranged charging line which contains inductances between the connections of said central charging line to said capacitors, said inductances being sufficient to prevent discharging of the capacitors through said central charging line;

discharging said plurality of capacitors in series through said triggered spark gap switches, said discharge beginning at the end of said vessel opposite to said one end of said transmission line, said discharging taking place in a predetermined manner such that the closing of said switches proceeds with a phase velocity equal to the velocity of light and causes the formation of an electromagnetic wave which moves down said transmission line to the other end thereof in a predetermined time period with said electromagnetic wave growing in amplitude as it moves down said transmission line and producing a magnetic field, said predetermined time period being sufficiently short so as to ensure magnetic self-insulation, the spacing between said outer cylindrical conductors and said vessel increasing in the direction towards said one end of the transmission line in such a manner as to acccommodate said increase in amplitude;

applying said electromagnetic wave to said beam producing diode means to produce a charged particle beam.

4,412,968

NUCLEAR REACTOR CONTROL APPARATUS

Bettadapur N. Sridhar, Cupertino, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,308
Int. Cl.³ G21C *7/08*
U.S. Cl. 376—233 **9 Claims**

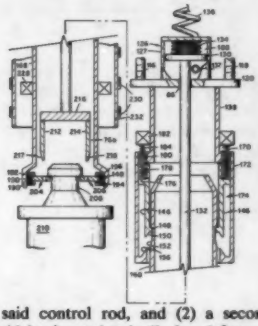
1. Apparatus for controlling fission in a nuclear reactor core, comprising:

a vertically movable carriage;

a vertically disposed control rod support tube carried by and positioned under said carriage;

a vertically disposed control rod carrying a neutron absorber at its lower end and having a detent notch at its upper end, said control rod being mounted for reciprocation along its longitudinal axis between (1) a raised position wherein its detent notch is positioned at the lower end of said control rod support tube and said absorber is above said core, and (2) a lowered position wherein said absorber is positioned within said core;

a latch mounted on the lower end of said control rod support tube for pivotal movement between (1) a first position wherein a portion of said latch is disposed in the detent



notch in said control rod, and (2) a second position wherein said latch portion is displaced from said detent notch;

an actuator shaft supported by said carriage and extending through said control rod support tube to the lower end thereof, said actuator shaft having a cam means at its lower end and being mounted for reciprocation along its longitudinal axis between (1) a raised position relative to said control rod support tube wherein it permits said latch to remain in said first position thereof, and (2) a lowered position relative to said control rod support tube wherein said cam means displaces said latch to said second position thereof; and

means mounted on said carriage for moving said actuator shaft between said raised and lowered positions.

4,412,969

COMBINATION PIPE RUPTURE MITIGATOR AND IN-VESSEL CORE CATCHER

Roger W. Tilbrook, Monroeville, Pa., and Franz J. Markowski, Richard, Wash., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

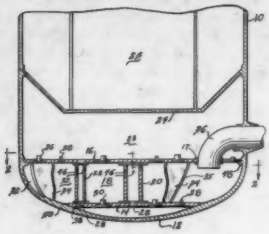
Filed Mar. 9, 1982, Ser. No. 356,569
Int. Cl.³ G21C *15/00*
U.S. Cl. 376—280 **11 Claims**

1. In a liquid-cooled nuclear reactor having a plurality of coolant loops for supplying coolant to a reactor core supported on a core support structure and which is positioned within a reactor vessel, a device for mitigating the effects of a failed coolant loop and for catching particulated material from the core, comprising:

a first plate capable of retaining particulated core material, the first plate being positioned beneath said core support structure and spanning the cross-section of said reactor vessel such that the first plate and the bottom wall of said reactor vessel form a chamber,

means comprising imperforate partitions extending downwardly from the first plate for dividing the chamber into a plurality of separate sections such that there is one section of the chamber for each coolant loop,

at least one inlet pipe from each coolant loop, each inlet pipe entering said reactor vessel and positioned such that it discharges into a separate one of said sections of the chamber, and



a plurality of nozzles extending through the first plate, the nozzles being designed such that the pressure drop from the core region to the chamber is greater than the pressure drop from the chamber to the core region, thus reducing the volume of fluid flowing out of the reactor vessel through a failed coolant loop.

4,412,970

PALLADIUM BASED DENTAL ALLOYS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Filed Dec. 6, 1982, Ser. No. 447,012
Int. Cl.³ C22C 5/02
U.S. Cl. 420—463 4 Claims

1. A grain-refined palladium based dental alloy for porcelain-fused-to-metal restorations consisting by weight of essentially about 75–80% palladium, 8–10% cobalt, 0–5% indium, 0–10% tin, 0.05–0.2% aluminum and 0.15–0.50% rhenium, the total of the constituents being 100%.

4,412,971

ELECTRICAL CONTACT MATERIALS OF INTERNALLY OXIDIZED AG-SN-BI ALLOY

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Japan

Filed Feb. 11, 1982, Ser. No. 348,142
Int. Cl.³ C22C 5/06
U.S. Cl. 420—501 2 Claims

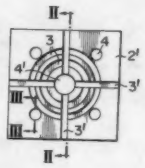
1. An electrical contact material made from a silver alloy containing solute metal elements of a total amount of from 3—less than 5 weight % of Sn, and 0.01–1.0 weight of Bi, said silver alloy having been internally oxidized.

4,412,972

ALUMINUM BASE BEARING ALLOY

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Co., Inc., Japan

Filed Aug. 3, 1982, Ser. No. 404,674
Claims priority, application Japan, Mar. 31, 1982, 57-52398
Int. Cl.³ C22C 21/14
U.S. Cl. 420—530 4 Claims



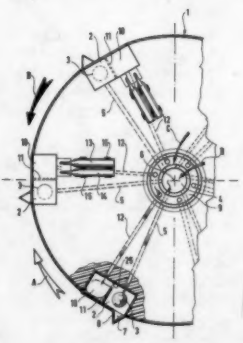
1. An aluminum base bearing alloy consisting essentially, by weight, of over 9.0% and below 40% lead, 0.2–5% copper, 0.2–10.0% tin, 0.1–10.0% silicon, 0.01–3% at least one element selected from the group consisting of, vanadium, titanium, zinc, cobalt and zirconium, and the balance being incidental impurities and aluminum.

4,412,973

AUTONOMOUS SIMULTANEOUS ANALYSIS APPARATUS AND A METHOD OF USING IT

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France

Filed Dec. 14, 1981, Ser. No. 330,430
Claims priority, application France, Dec. 15, 1980, 80 26528
Int. Cl.³ G01N 21/07, 33/54
U.S. Cl. 422—72 14 Claims



1. Analysis apparatus of the kind which uses a reaction support to hold successively a quantity of a liquid which contains a substance to be analysed and then a quantity of a liquid reagent to react therewith, said apparatus comprising an analysis rotor having: a plurality of peripheral reaction cells each containing a solid reaction support; means for centrifuging a washing liquid directly into each reaction cell; a peripheral liquid-removal orifice for each reaction cell; the improvement comprising:

a buffer cell operatively associated with each reaction cell;

separate means for successively centrifuging at least said liquid containing a compound to be analysed and a first reagent directly into said buffer cell;

means for storing predetermined quantities of said first reagent in sealed receptacles and for opening said receptacles when it is required to centrifuge the first reagent into said buffer cells;

means for communicating said reaction cells and said buffer cells; and

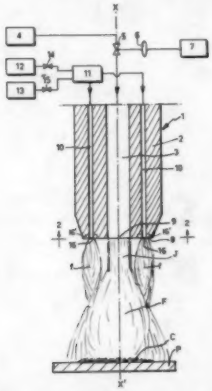
the buffer cell-reaction cell pairs being so arranged that liquid in the buffer cells moves into the associated reaction cells when centrifuging stops.

4,412,974

PRODUCTION OF CARBON BLACK BY AN INCOMPLETE AIR-ACETYLENE COMBUSTION REACTION

Jacques Nicolas, Paris; Antoine Berger, Nantes, and Christian Laminette, Lille, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 160,683, Jun. 18, 1980, abandoned.
This application Jan. 15, 1982, Ser. No. 339,480
Claims priority, application France, Jul. 3, 1979, 79 17173
Int. Cl.³ C09C 1/48
U.S. Cl. 422—156 9 Claims



1. Apparatus for manufacturing carbon black by incomplete air-acetylene combustion reaction comprising:

a body which is provided with a passage and means defining a discharge orifice, in communication with said passage, for delivering a flow of a pressurized acetylene jet out of said body;

a plurality of heating nozzle means, having conduits leading thereto, provided in said body where said heating nozzle means are aligned in said body such that said heating nozzle means are means for directing and combusting a flow of comburant-fuel mixture passing through the heating nozzle means to heat the acetylene jet outside of said body at said discharge orifice means such that a cracking of acetylene molecules in the acetylene jet is effected prior to an incomplete air-acetylene combustion;

surface means for collection of and cooling of carbon black, the surface means located relative to said body such that said collection and cooling is effected; and

means for providing acetylene to the acetylene passage;

means for providing the comburant-fuel mixture to the comburant-fuel conduits;

means for controlling the flows of the comburant-fuel mixture and acetylene such that said cracking is effected prior to said incomplete air-acetylene combustion

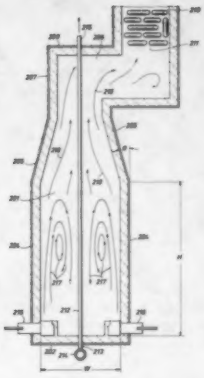
and such that carbon black is formed and collected on said surface means.

4,412,975

FIRED PROCESS HEATER

William D. Parizot; Paul D. O'Lenick, both of Katy, and Lowell D. Fraley, Sugarland, all of Tex., assignors to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 166,880, Jul. 8, 1980, Pat. No. 4,324,649.
This application Dec. 17, 1981, Ser. No. 331,485
Int. Cl.³ B01J 19/24
U.S. Cl. 422—197 4 Claims



1. A fired tubular heater which comprises:

(a) a radiant chamber for passage of combustion gas having a floor, opposed vertical end walls contiguous with the floor, opposed planar vertical lower side walls contiguous with the floor and the end walls, opposed intermediate side walls contiguous with the end walls and the lower side walls, the intermediate side walls sloping inwardly from the lower side walls, at least one upper side wall contiguous with the end walls and one of the intermediate side walls and, a roof contiguous with the end walls and an upper side wall, the end walls, lower side walls, intermediate side walls, upper side walls, and roof having no burners;

(b) a plurality of straight, vertical, tubular heat exchange means having a single pass in heat exchange relationship with the combustion gas which are parallel the lower side walls, disposed centrally within and extend through the radiant chamber, and terminate at their upper extremities proximate the roof; and

(c) a plurality of burners proximate the floor which are disposed to direct combustion gas upwardly into the radiant chamber.

4,412,976

ADJUSTABLE WHEEL ASSEMBLY IN A ROTARY SOLVENT EXTRACTOR

Donald A. Gessler, Verona, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

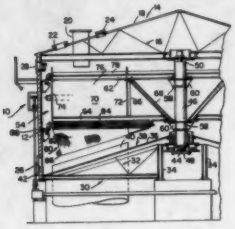
Filed Sep. 8, 1981, Ser. No. 300,380
Int. Cl.³ B01D 11/02
U.S. Cl. 422—270 6 Claims

1. In a rotary solvent extractor including a vessel in which there is disposed a plurality of cells formed by a plurality of radially-extending side walls arranged in circumferential fashion on a generally horizontal plane around a vertically-disposed rotor, a feed conduit for introducing solids to be treated into said cells, a solid-retaining cell bottom closure including a wheel member for each cell of said cells, a track mounted to said vessel proximate said side walls of said plurality of cells on which track said wheel member rides to maintain said bottom closure in substantially closed position during a predetermined portion of a rotational path of each cell, conduits for successively introducing solvent into said cells from above said pre-

determined portion of said rotational path, a liquid collection zone disposed beneath said cells and including a plurality of compartments for receiving miscellas, an improved wheel housing assembly to permit elevational adjustment of said wheel with respect to said track, which comprises:

an axle housing member including a cylindrically-shaped chamber mounted to said cell bottom closure;

a wheel axle including a housing shaft portion and a wheel shaft portion, the axis of said wheel shaft portion being



parallel and offset from the axis of said housing shaft portion, said housing shaft portion being initially rotatable positionable within said cylindrically-shaped chamber of said axle housing member; and

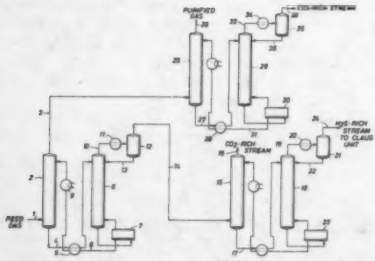
a wheel member rotatably mounted on said wheel shaft portion whereby rotation of said housing shaft portion within said cylindrically-shaped chamber of said axle housing member permits elevational adjustment of said wheel member with respect to said track.

4,412,977

SELECTIVE ACID GAS REMOVAL

Edwin J. Fisch, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 19, 1982, Ser. No. 369,454
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—226 **3 Claims**



1. A process for the selective removal of acidic compounds from a feed gas stream containing CO_2, H_2S and COS which comprises:

(a) contacting said feed gas stream in a first stage at a temperature of from 32° C. to 57° C. and a pressure of from 23 atmospheres to 82 atmospheres with a first aqueous absorbent solution, said solution containing between 30 and 50 percent by weight water, between 30 and 60 percent by weight of a secondary or tertiary alkanolamine and between 10 and 40 percent by weight of a tetramethylene sulfone, thereby producing (i) a gaseous COS-rich stream containing greater than about 80 percent by volume of the COS in said feed gas stream, and (ii) an acid gas-loaded first absorbent stream, the ratio of said first aqueous absorbent solution to said feed gas stream being such that the amount of H_2S plus CO_2 in said acid gas-loaded first absorbent stream is 85% or more of equilibrium;

(b) stripping said acid gas-loaded first absorbent stream and producing an acid gas stream containing principally H_2S and CO_2;

(c) selectively absorbing H_2S from said acid gas stream in a second stage with a second absorbent solution containing water and a secondary or tertiary alkanolamine to produce (i) a stream containing predominately CO_2 and (ii) an H_2S-rich absorbent stream;

(d) regenerating said H_2S-rich absorbent stream to produce a stream containing predominately H_2S;

(e) contacting said gaseous COS-rich stream from step (a) with a third absorbent solution containing between 10 and 15 percent by weight water, between 30 and 45 percent by weight diisopropanolamine and between 40 and 60 percent by weight of a tetramethylene sulfolane in a third stage to produce (i) an acid gas-free stream and (ii) a COS-rich absorbent stream; and

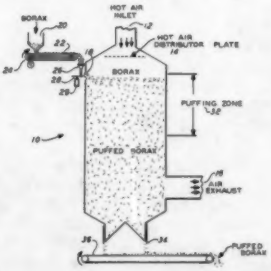
(f) regenerating said COS-rich absorbent stream to produce a stream containing predominately COS.

4,412,978

METHOD AND APPARATUS FOR MANUFACTURING IMPROVED PUFFED BORAX

Raymond T. Ertle, Pompton Plains, N.J., assignor to Stokely-Van Camp, Inc., Indianapolis, Ind.

Filed Mar. 15, 1982, Ser. No. 358,050
Int. Cl.³ C01B *35/12*
U.S. Cl. 423—279 **16 Claims**



1. A method for producing a free-flowing, agglomerate-free puffed borax product having high bead strength, comprising the steps of:

(a) establishing a top to bottom laminar flow of heated air through a vertical tower;

(b) introducing hydrated borax particles at a given point in said heated laminar flow air stream to be carried by the air stream in the direction of flow for a time sufficient to produce said puffed particles; said hydrated borax particles being introduced into the air stream in the form of a horizontally dispersed sheet of particles; and

(c) recovering the puffed particles downstream from the point of introduction of the particles.

4,412,979

PROCESS FOR PREPARING ALUMINUM OR MAGNESIUM PHOSPHIDE

Franziskus Horn, Rodgem, and Ekkehard Fluck, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Degesch, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 193,481, Oct. 3, 1980, Pat. No. 4,331,642. This application Apr. 5, 1982, Ser. No. 365,322

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 2945647

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ C01B *25/08*

U.S. Cl. 423—299 6 Claims

1. A process of preparing the phosphide of aluminum or magnesium comprising slowly adding both the finely divided metal or an alloy of the two metals and liquid yellow phosphorus to the reaction vessel at a temperature between 300° and 600° C. in an inert gas atmosphere and in the presence of a catalytically effective amount of the element chlorine, bromine, or iodine or a compound of such element with phosphorus, sulfur, hydrogen, ammonium, zinc, or the metal being reacted.

4,412,980

METHOD FOR PRODUCING A DIAMOND SINTERED COMPACT

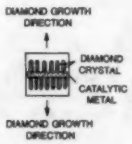
Kazuo Tsuji; Shuji Yazu, and Akio Hara, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 158,136, Jun. 10, 1980, Pat. No. 4,333,986. This application Feb. 25, 1982, Ser. No. 352,249

Claims priority, application Japan, Jun. 11, 1979, 54-73670; May 30, 1980, 55-73570

Int. Cl.³ C01B *31/06*

U.S. Cl. 423—446 11 Claims



1. A method for producing a diamond sintered compact having diamond crystal particles uniformly oriented in a particular direction, which comprises placing a carbonaceous material as a raw material for producing diamond, and a catalytic metal for crystallizing diamond, in layered or concentric relationship to each other the catalytic metal comprising between 5 to 50 weight % of the total weight of the carbonaceous material and catalytic metal, a metal inert to synthesis of diamond or a metal having a higher melting point than the catalytic metal being interposed at the interface between the carbonaceous material and catalytic metal, subjecting the resultant assembly to temperature and pressure under conditions of a pressure higher than 65 kb, and a temperature higher by 200° C. than the eutectic temperature of the catalytic metal and carbon and lower by 100° C. than the thermodynamic equilibrium line of diamond versus graphite, the rate of temperature rise beyond the eutectic temperature being at least 100° C./min. predetermined pressure and temperature conditions within these limits being maintained for a time sufficient for formation and growth of diamond crystals and sintering of each diamond particle, thereby enabling synchronous transformation of the carbonaceous material into diamond and sintering of the diamond.

4,412,981

CONVERSION OF HYDROGEN SULFIDE TO SULFUR BY DIRECT OXIDATION

Donald H. Kubicek, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 16, 1981, Ser. No. 302,942

Int. Cl.³ C01B *17/04;* B01D *53/34*

U.S. Cl. 423—573 R 9 Claims

1. A process for the absorption and subsequent conversion of hydrogen sulfide to sulfur by direct oxidation, comprising contacting a gaseous or liquid feedstock containing hydrogen sulfide with a reaction system consisting essentially of

(a) a hydroxyl-containing liquid or liquids represented by the formula ROH, where R equals hydrogen or an alkyl or alkylene radical having from 1 to 6 carbon atoms or a mixture of two or more of said liquids;

(b) at least one base, selected from the group consisting of (1) ammonium hydroxide, (2) amines having from 1 to about 6 carbon atoms and 1 or 2 amine groups, and (3) metal hydroxides represented by the formula $M(OH)_n$, where M is an alkali or alkaline earth metal and n is 1 or 2 depending upon the valence of M, and

(c) free oxygen introduced as an oxidant by using air, a mixture of air and oxygen, or a mixture of oxygen with inert gases,

wherein said reaction is carried out in the absence of ions or particles of metals of the iron group, and said reaction optionally is carried out in the presence of an inert hydrocarbon solvent.

4,412,982

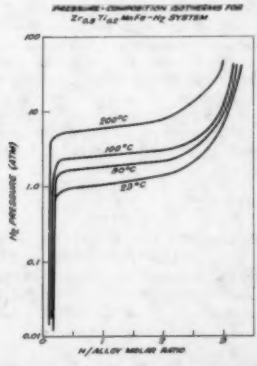
ZIRCONIUM-TITANIUM-MANGANESE-IRON ALLOY CHARACTERIZED BY $ZRMN_2$ STOICHIOMETRY

William E. Wallace, Pittsburgh, Pa.; Vijay K. Sinha, Bihar, India, and Faiz Purarian, Qazvin, Iran, assignors to Keppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 30, 1982, Ser. No. 373,672

Int. Cl.³ C22C *30/00;* C01B *6/00*

U.S. Cl. 423—644 19 Claims



1. A quaternary alloy of elements expressed by the following formula

$$Zr_{1-x}Ti_xMn_{2-y}Fe_y$$

wherein "x" has a value in a range from about 0.2 to about 0.3, and "y" has a value in a range from about 0.1 to about 1.

4,412,983

DENTIFRICES CONTAINING AMORPHOUS SILICA

Robert L. Mitchell, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 58,600, Jul. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,451, Dec. 4, 1978, abandoned, which is a division of Ser. No. 770,344, Feb. 22, 1977, Pat. No. 4,141,969. This application Sep. 27, 1982, Ser. No. 423,951

Int. Cl.[3] A61K *7/18*

U.S. Cl. 424—52 12 Claims

1. A dental cream composition compatible with the surface of an unlined aluminum container and contained in said container, comprising dental vehicle and dispersed therein synthetic precipitated silica essentially free of alumina which silica has an aggregrate particle size of about 2 to 20 microns and an essentially amorphous X-ray structure, a compound which provides fluorine in amount of about 0.01% to 1% by weight and a calcium salt selected from the group consisting of calcium carbonate, calcium metasilicate and calcium phosphate in amount to provide at least about 0.01% to about 0.3% by weight of calcium in water.

4,412,984

FLAVOR POTENTIATED ORAL COMPOSITIONS CONTAINING THAUMATIN OR MONELLIN

Henricus E. van der Loo, and Charles Wiener, both of Middletown, N.Y., assignors to Talres Development (N.A.) N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 899,113, Apr. 24, 1978, Pat. No. 4,300,576. This application Sep. 10, 1981, Ser. No. 300,807

Claims priority, application United Kingdom, Apr. 26, 1977, 17335/77

Int. Cl.[3] A61K *7/26;* A23L *1/22*

U.S. Cl. 424—58 8 Claims

1. A flavoured oral composition containing thaumatin or monellin at a flavour potentiating level, which level is below the detectable sweetness threshold of thaumatin or monellin respectively in the composition.

4,412,985

DEPYROGENATION PROCESS

Edward Shanbrom, 2252 Liane La., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 194,263, Oct. 6, 1980, Pat. No. 4,315,919. This application Jan. 4, 1982, Ser. No. 336,916

Int. Cl.[3] A61K *31/74;* A61L *2/16*

U.S. Cl. 424—78 9 Claims

1. The method of depyrogenating a biomedical product or material comprising treating said product or material by prolonged contact with a solution or suspension of about 0.1% to about 10% by weight of a nonionic amphiphile selected from the group consisting of substances having the general formula $RC_6H_4(OC_2H_4)_nOH$ wherein R is octyl or nonyl and n is at least 3, followed by separating said amphiphile from the resulting depyrogenated product or material by liquid phase separation.

4,412,986

NIFEDIPINE-CONTAINING SOLID PREPARATION COMPOSITION

Hiroitsu Kawata, Kawagoe; Tadayoshi Ohmura, Niiza; Katsuhiko Yano, Omiya; Mikio Matsumura, Tokyo; Saburo Higuchi, Hasuda, and Yoshiaki Soeishi, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co. Ltd., Tokyo, Japan

Division of Ser. No. 908,510, May 22, 1978, abandoned. This application Apr. 16, 1981, Ser. No. 254,882

Claims priority, application Japan, Jun. 7, 1977, 52-67039; Jul. 14, 1977, 52-84372

Int. Cl.[3] A61K *31/79, 31/455, 47/00*

U.S. Cl. 424—80 15 Claims

1. A nifedipine-containing solid composition comprising a coprecipitate (a) of nifedipine and (b) about 1 to 20 times its weight of a member selected from the group consisting of polyvinylpyrrolidone, methylcellulose, hydroxypropylcellulose and hydroxypropylmethylcellulose.

4,412,987

ADDITION AGENT FOR MEDICINES OR COSMETICS

Kazuharu Nakazawa, No. 105 Oji-Mansion, 7-8, 3-chome, Harada-dori, Nada-ku, Kobe-shi, Japan

Filed Sep. 24, 1981, Ser. No. 305,345

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 55-144589

Int. Cl.[3] A61K *35/32*

U.S. Cl. 424—95 8 Claims

1. An addition agent for medicines and cosmetics obtained by (1) heating fats and bones of a pig in two stages, the first stage being at a temperature of 700° to 1,000° C., and the second stage being at a temperature of 1,300° to 1,400° C., (2) filtering the resultant hot solution to remove precipitates therefrom, and (3) allowing the resultant filtrate to stand at room temperature.

4,412,988

HEXAPEPTIDES

Jean-Claude Gasc, Bondy; Serge Geoffre, Cestas; Michel Hospital, Talence, and Jacques Laurent, Issy-les-Moulineaux, all of France, assignors to Roussel Uclaf, Paris, France

Filed Oct. 9, 1981, Ser. No. 310,392

Claims priority, application France, Oct. 14, 1980, 80 21919

Int. Cl.[3] C07C *103/52;* A61K *37/02*

U.S. Cl. 424—177 24 Claims

1. A compound selected from the group consisting of hexapeptides of the formula

Cys-X-Y-D-Lys-Z I

wherein x is a sequence selected from the group consisting of Ala-Ala and Giu-His, Y is selected from the Group consisting of Cys and Phe, Z is Phe when Y is Cys or Z is Cys when Y is Phe, the two Cys groups in the molecule being joined by a disulfide bridge, their non-toxic, pharmaceutically acceptable acid addition salts; their salts of non-toxic, pharmaceutically acceptable bases, their non-toxic, pharmaceutically acceptable esters and their amides and N-alkyl or N,N-dialkyl amides of 1 to 5 carbon atoms and their metallic complexes with a metal selected from the group consisting of cobalt, nickel, copper, iron and zinc.

4,412,989

OXYGEN CARRIER

Yuji Iwashita, Kawasaki; Katsumi Ajisaka, Yokohama, and Keiji Iwasaki, Kawasaki, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,606

Claims priority, application Japan, Jun. 10, 1981, 56-89315

Int. Cl.[3] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 12 Claims

1. An oxygen carrying material containing hemoglobin or a hemoglobin derivative covalently coupled through an amide bond to a polymer selected from the group consisting of polyethylene glycol, polypropylene glycol, and copolymers of ethylene oxide and propylene oxide.

4,412,990
COMPOSITION HAVING ENHANCED OPSONIC ACTIVITY

John L. Lundblad, El Cerrito; Miriam D. Budinger, Berkeley, and Richard S. Schwartz, Burlingame, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Jul. 2, 1982, Ser. No. 394,977
Int. Cl.³ A61K *37/00, 35/14*
U.S. Cl. 424—177 22 Claims

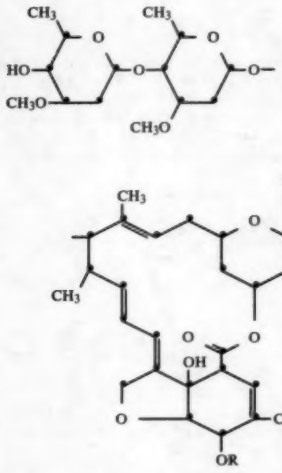
1. A pharmaceutical composition comprising purified immune globulin and fibronectin in amounts sufficient to produce an opsonic activity in the composition that is greater than the additive opsonic activity of the immune globulin and fibronectin alone.

4,412,991
22-HYDROXY DERIVATIVES OF C-076 COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Robert E. Ormond, Edison, N.J., assignor to Merck & Co., Inc., Rayway, N.J.

Filed Aug. 28, 1981, Ser. No. 297,442
Int. Cl.³ A61K *31/71;* C07H *17/08;* C12P *19/62*
U.S. Cl. 424—180 5 Claims

1. A compound having the formula:



wherein R is hydrogen or methyl.

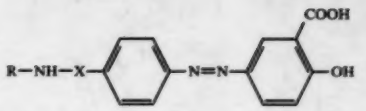
5. A method for the treatment of helminth, acarid, nematode and insect infections which comprises administering to an animal infected with parasitic infection, an effective amount of one or more of the compounds of claim 1.

4,412,992
2-HYDROXY-5-PHENYLAZOBENZOIC ACID DERIVATIVES AND METHOD OF TREATING ULCERATIVE COLITIS THEREWITH

Rosalind P. K. Chan, London, England, assignor to Biorex Laboratories Limited, England

Filed Jul. 8, 1981, Ser. No. 281,504
Claims priority, application United Kingdom, Jul. 21, 1980, 8023826
Int. Cl.³ A61K *31/655;* C07C *107/06*
U.S. Cl. 424—226 13 Claims

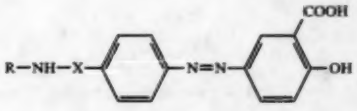
1. 2-Hydroxy-5-phenylazobenzoic acid derivatives of the general formula:



(Ia)

wherein X is an —SO_2— or —CO— group and R is either a phenyl or carboxymethylphenyl radical or is a radical of the formula —$(CH_2)_n$—Y, in which Y is a hydroxyl group, an amino group, a monoalkyl- or dialkyl-amino group, the alkyl moieties of which contain up to 6 carbon atoms or a carboxylic or sulphonic acid group and n is a whole number of from 1 to 6 and in which one or more of the hydrogen atoms in the alkylene radical can be replaced by amino groups, monoalkyl- or dialkyl-amino groups, the alkyl moieties of which contain up to 6 carbon atoms or alkyl radicals and in which the —$(CH_2)_n$—Y radical is either attached directly to the nitrogen atom or via a benzene ring, with the proviso that R—NH—X— is other than a —CO—NH—CH_2—COOH radical; and the esters and non-toxic, pharmacologically acceptable salts thereof.

12. A pharmaceutical composition for the treatment of ulcerative colitis in humans, containing an effective amount to treat ulcerative colitis, of at least one compound of the formula:



(I)

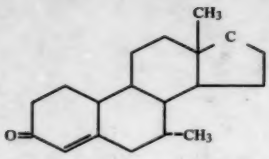
wherein X is an —SO_2— or —CO— group and R is either phenyl or carboxymethylphenyl radical or is a radical of the general formula —$(CH_2)_n$—Y, in which Y is a hydroxyl group, an amino group or a monoalkyl- or dialkyl-amino group, the alkyl moieties of which contain up to 6 carbon atoms or a carboxylic or sulphonic acid group and n is a whole number of from 1 to 6 and in which one or more hydrogen atoms in the alkylene radical can be replaced by amino groups, monoalkyl- or dialkyl-amino groups, the alkyl moieties of which contain up to 6 carbon atoms or alkyl radicals and in which the —$(CH_2)_n$—Y radical is either attached directly to the nitrogen atom or via a benzene ring; and/or containing at least one ester thereof and/or at least one non-toxic, pharmaceutically acceptable salt thereof, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,412,993
METHOD OF TREATING PSEUDOPREGNANCY, GALACTORRHEA AND MASTITIS IN MAMMALS

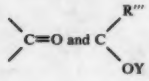
James H. Sokolowski, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 115,473, Jan. 25, 1980, abandoned. This application Jan. 28, 1981, Ser. No. 229,255
Int. Cl.³ A61K *31/56*
U.S. Cl. 424—243 11 Claims

1. A method for treating a mammal suffering from a disease selected from the group consisting of pseudopregnancy and galactorrhea which comprises treating said mammal with 30-500 mcg/kg of a compound having the formula



wherein C represents a group selected from the class consisting of



wherein R''' is selected from the class consisting of hydrogen and a lower aliphatic hydrocarbon radical containing from 1 to 4 carbon atoms, inclusive, and Y is selected from the class consisting of hydrogen and the acyl radical of a hydrocarbon carboxylic acid containing from 1 to 12 carbon atoms, inclusive.

4,412,994

MANNICH-BASE HYDROXAMIC ACID PRODRUGS, COMPOSITIONS AND USE

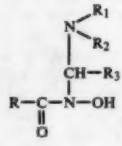
Kenneth B. Sloan, Eudora, Kans., and Roy Little, Gainesville, Fla., assignors to INTERx Research Corporation, Lawrence, Kans.

Continuation of Ser. No. 143,520, Apr. 24, 1980, abandoned. This application May 28, 1982, Ser. No. 383,375

Int. Cl.³ A61K *31/405, 31/535;* **C07D** *209/18, 413/12*

U.S. Cl. 424—248.53 **34 Claims**

1. A compound of the formula



(I)

wherein

is the acyl residue of indomethacin; R_1 and R_2, which can be the same or different, each represent a member selected from the hydrocarbon group consisting of alkyl of 1 to 20 carbon atoms; alkenyl or 2 to 20 carbon atoms; aryl or 6 to 10 carbon atoms; cycloalkyl of 3 to 8 carbon atoms; cycloalkenyl of 4 to 8 carbon atoms; alkynyl of 2 to 20 carbon atoms; aralkyl, alkaryl, aralkenyl, aralkynyl, alkenylaryl, and alkynylaryl, wherein the alkyl, alkenyl, alkynyl, and aryl portions are defined as above; or R_1 and R_2 are combined so that $—NR_1R_2$ together represent the residue of a saturated heterocyclic compound containing one secondary nitrogen atom; R_3 is hydrogen or R_1; or a non-toxic pharmaceutically acceptable acid addition salt or oxide thereof.

32. A pharmaceutical composition of matter comprising an anti-inflammatory effective amount of a compound of claim **1**, in combination with a nontoxic pharmaceutically acceptable inert carrier therefor.

4,412,995

PENTACYCLIC PHENYLPYRAZOLE COMPOUNDS AS ANTI-INFLAMMATORY AGENTS

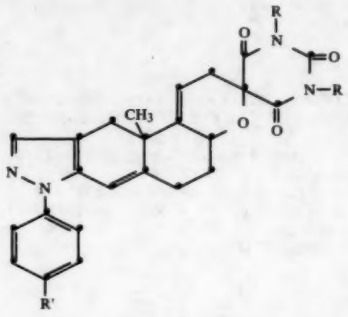
Malcolm R. Bell, East Greenbush, and John L. Herrmann, Jr., Kinderhook, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 236,215, Feb. 19, 1981, abandoned. This application Jan. 13, 1982, Ser. No. 339,116

Int. Cl.³ A10K *31/505;* **C07D** *231/54, 491/20*

U.S. Cl. 424—251 **12 Claims**

1. A compound having the formula:



wherein R is selected from the group consisting of hydrogen, methyl, ethyl, propyl, 2-propenyl and 2-propynyl; and R' is selected from the group consisting of hydrogen and fluoro.

11. A pharmaceutical composition for treating inflammation in mammals which comprises an anti-inflammatorily effective amount of a compound according to claim **1** and a pharmaceutically acceptable carrier.

4,412,996

PYRIDOXINE DERIVATIVES AND RELATED PHARMACEUTICAL COMPOSITIONS

Alberto Reiner, Como, Italy, assignor to Crinos Farmacologica Spa, Como, Italy

Filed Oct. 20, 1981, Ser. No. 313,311

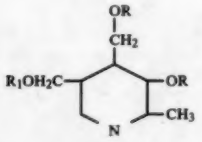
Claims priority, application Italy, Oct. 21, 1980, 25473 A/80

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.³ A61K *31/435;* **C07D** *401/112, 213/67*

U.S. Cl. 424—256 **10 Claims**

1. A derivative of pyridoxine and isopropylidene pyridoxine having the formula:



(I)

wherein the R radicals represent a hydrogen atom or, conjointly, an isopropylidene group, and R_1 represents the residue of an acid selected in the group comprising 1-(p-chlorobenzoyl)-2-methyl-5-methoxy-indol-3-acetic acid and 5-(2.4-difluorophenyl)-salicylic acid, and the related addition salts with non toxic and pharmaceutically acceptable, inorganic and organic acids.

6. An anti-inflammatory compositon comprising an anti-inflammatory amount of a derivative of pyroxidine or of isopropylidene pyridoxine according to one of claims **1**, **3**, **4** or **5**, together with pharmaceutically acceptable excipients and/or vehicles.

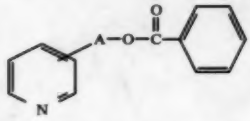
4,412,997

INSECT REPELLENT COMPOUNDS

Rayman Y. Wong, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 10, 1981, Ser. No. 329,365
The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.
Int. Cl.³ A01N *43/40*; C07D *213/55*
U.S. Cl. 424—263 8 Claims

1. A method of repelling insects from a locus to be protected therefrom, comprising applying to said locus an effective insect repelling amount of a compound having the formula



in which A is an alkylene group having from 1 to 3 carbon atoms.

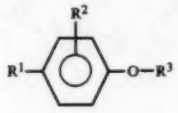
4,412,998

CERTAIN 4-(1-PIPERIDINO)-PHENYL-NICOTINATES

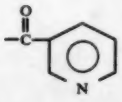
Arthur Scherm, Bad Homburg; Dezsoe Peteri, Hattersheim, and Klaus Hummel, Frankfurt, all of Fed. Rep. of Germany, assignors to Merz & Company, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 222,679, Jan. 5, 1981, Pat. No. 4,321,268, which is a continuation-in-part of Ser. No. 119,576, Feb. 7, 1980, abandoned. This application Nov. 27, 1981, Ser. No. 325,290
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904757; Mar. 10, 1980, 3009099
Int. Cl.³ C07D *401/10*; A61K *31/455*
U.S. Cl. 424—267 6 Claims

1. Compounds having the general formula:



wherein R^1 = 1-piperidinyl
and
R^2 =
(a) $(-CH_2-)_n$, where n = 4 forming the 5,6,7,8-tetrahydro-1-naphthyl ring
(b) Halogen
(c) C_1–C_6-alkyl or C_3–C_6-cycloalkyl
(d) Methoxy
(e) Ethoxy
(f) Trifluoromethyl
(g) Nitro
(h) Hydrogen,
and R^3 =



and pharmaceutically-acceptable acid addition salts thereof.

5. Method for the treatment of hyperlipidemia comprising the step of administering to a subject in need of such therapy, by the oral or parenteral route, an effective hyperlipidemic amount of a compound of claim 1.

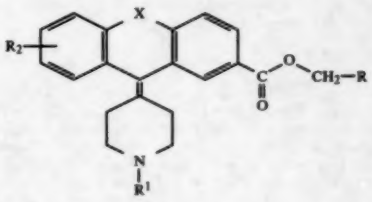
4,412,999

ANTI-EMETIC ESTERS OF CYPROHEPTADINE-3-CARBOXYLIC ACID AND STRUCTURALLY RELATED COMPOUNDS

David C. Remy, North Wales, and Bradley V. Clineschmidt, Norristown, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

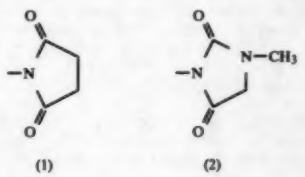
Filed Apr. 14, 1982, Ser. No. 368,257
Int. Cl.³ A61K *31/445*; C07D *401/12*
U.S. Cl. 424—267 20 Claims

16. A method of treating emesis, gastro-oesophageal reflux and/or dyspepsia comprising the prophylactic or therapeutic administration to a patient in need of such treatment of an effective dopamine antagonistic amount of a compound of structural formula:

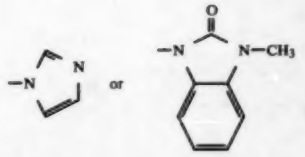


I

or a pharmaceutically acceptable salt thereof, wherein
X is (1) —CH=CH—, or (2) —CH_2—CH_2—;
R is



(1) (2)



(3) or (4)

R^1 is (1) C_{1-3}alkyl, or (2)

and
R^2 is (1) hydrogen, (2) C_{1-3}alkyl, or (3) fluoro.

4,413,000

β-LACTAM ANTIBIOTICS, THEIR PREPARATION AND USE

Alfred J. Eglington, Betchworth, England, assignor to Beecham Group Limited, England

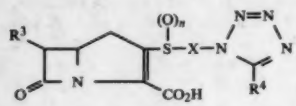
Filed Jul. 8, 1981, Ser. No. 281,553

Claims priority, application United Kingdom, Jul. 11, 1980, 8022830

Int. Cl.[3] C07D *403/14;* A61K *31/41*

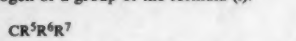
U.S. Cl. 424—269 33 Claims

1. A compound of the formula (II):



(II)

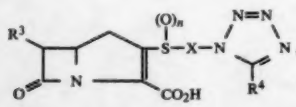
a salt thereof or an ester thereof convertible to the free acid or salt thereof by biological or chemical methods wherein R^3 is hydrogen or a group of the formula (i):



(i)

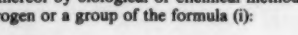
wherein R^5 is hydrogen, sulphonato-oxy or a salt or ester thereof, hydroxy, alkoxy of 1 to 4 carbon atoms, $OCOR^8$ or OCO_2R^8 wherein R^8 is alkyl of 1 to 4 carbon atoms, phenyl or benzyl unsubstituted or substituted by fluoro, chloro, bromo, alkoxy of 1 to 3 carbon atoms or nitro; R^6 is hydrogen or alkyl of 1 to 4 carbon atoms; and R^7 is hydrogen or alkyl of 1 to 4 carbon atoms, n is zero or one, X is a saturated or unsaturated hydrocarbon unsubstituted or substituted by bromo or chloro, and R^4 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cyclobutyl, cyclohexyl, hydroxymethyl, hydroxyethyl, hydroxypropyl, methoxymethyl, methoxyethyl, ethoxymethyl, ethoxyethyl, phenoxymethyl, phenoxyethyl, hydroxyphenoxymethyl, aminomethyl, aminoethyl, aminopropyl, phenacylmethyl, benzyloxycarbonylmethyl, benozyloxycarbonylethyl, methoxycarbonylmethyl, methoxycarbonylethyl, fluoromethyl, fluoroethyl, cyclopentenyl, cyclohexenyl, benzyl, phenethyl, thienylmethyl, furylmethyl, α-hydroxybenzyl, α-carbonylbenzyl, α-azidobenzyl, α-tetrazolylbenzyl, α-aminobenzyl, p-hydroxybenzyl, α-amino(p-hydroxy)benzyl, α-carboxy(p-hydroxy)benzyl, phenyl, furyl, thienyl, hydroxyphenyl, naphthyl, methoxyphenyl, chlorophenyl or methoxycarbonylphenyl.

12. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula (II):



(II)

a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof convertible to the free acid or salt thereof by biological or chemical methods wherein R^3 is hydrogen or a group of the formula (i):



(i)

wherein R^5 is hydrogen, sulphonato-oxy or a salt or ester thereof, hydroxy, alkoxy of 1 to 4 carbon atoms, $OCOR^8$ or OCO_2R^8 wherein R^8 is alkyl of 1 to 4 carbon atoms, phenyl or benzyl unsubstituted or substituted by fluoro, chloro, bromo, alkoxy of 1 to 3 carbon atoms or nitro; R^6 is hydrogen or alkyl of 1 to 4 carbon atoms; and R^7 is hydrogen or alkyl of 1 to 4 carbon atoms, n is zero or one, X is a a saturated or unsaturated hydrocarbon unsubstituted or substituted by bromo or chloro, and R^4 is alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, cyclobutyl, cyclohexyl, hydroxymethyl, hydroxyethyl, hydroxypropyl, methoxymethyl, methoxyethyl, ethoxymethyl, ethoxyethyl, phenoxymethyl, phenoxyethyl, hydroxyphenoxymethyl, aminomethyl, aminoethyl, aminopropyl, phenacylmethyl, benzyloxycarbonylmethyl, benzoloxycarbonylethyl, methoxycarbonylmethyl, methoxycarbonylethyl, fluoromethyl, fluoroethyl, cyclopentenyl, cyclohexenyl, benzyl, phenethyl, thienylmethyl, furylmethyl, α-hydroxybenzyl, α-carbonylbenzyl, α-azidobenzyl, α-tetrazolylbenzyl, α-aminobenzyl, p-hydroxybenzyl, α-amino(p-hydroxy)benzyl, α-carboxy(p-hydroxy)benzyl, phenyl, furyl, thienyl, hydroxyphenyl, naphthyl, methoxyphenyl, chlorophenyl or methoxycarbonylphenyl, in combination with a pharmaceutically acceptable carrier.

4,413,001

N-ARYL OXAZOLIDINONES, OXAZOLIDINETHIONES, PYRROLIDINONES, PYRROLIDINES AND THIAZOLIDINONES

Guy R. Bourgery, Colombes; Colette A. Douzon, Paris; Jean-Francois R. Ancher, Rueil-Malmaison; Alain P. Lacour, La Varenne; Patrick G. Guerret, Rueil-Malmaison; Michel Langlois, Buc, and Philippe L. Dostert, Le Vesinet, all of France, assignors to Delalande S.A., Courbevoie, France

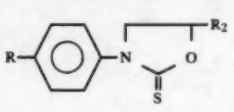
Division of Ser. No. 45,143, Jun. 4, 1979, Pat. No. 4,348,393. This application Jun. 16, 1982, Ser. No. 388,867

Claims priority, application France, Jun. 9, 1978, 78 17388; Aug. 17, 1978, 78 24024

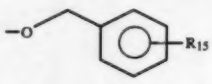
Int. Cl.[3] A61K *31/42, 31/44;* C07D *263/14, 263/46*

U.S. Cl. 424—272 7 Claims

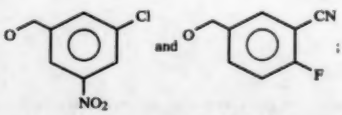
1. A compound having the formula



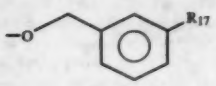
in which R_2 is $—CH_2OH$, $—CH_2OR_{16}$ wherein R_{16} is alkyl having from 1 to 3 carbon atoms, or $—CH_2OCOR_{18}$, wherein R_{18} is methyl or ethyl, and when R_2 is $—CH_2OH$, R is selected from the group consisting of alkoxy having from 2 to 5 carbon atoms, cyclopentylmethoxy, cyclohexylmethoxy, (cyclohexen-1-yl)methoxy, (tetrahydropyran-4-yl)methoxy, cyanomethoxy, 2-cyanoethoxy, 3-cyanopropoxy, 4-cyanobutoxy,



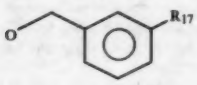
wherein R_{15} is 3—Cl, 4—Cl, 3—F, 4—F, 3—NO_2, 3—CN or 3—CF_3,



when R_2 is $—CH_2OR_{16}$, R is selected form the group consisting of 3-methylbutoxy, cyclopentylmethoxy, cyclohexylmethoxy, 4-cyanobutoxy,



wherein R_{17} is CN or NO_2, 3-cyano-5-nitrobenzyloxy or pyridinyl-3-methoxy; and when R_2 is $—CH_2OCOR_{18}$, R is cyclohexylmethoxy or



wherein R_{17} is CN or NO_2.

4,413,002

BRONCHODILATING HYDANTOIN DERIVATIVES

Gordon Wootton, Sawbridgeworth, England, assignor to Beecham Group Limited, England

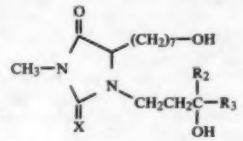
Filed Jan. 16, 1980, Ser. No. 112,693

Claims priority, application United Kingdom, Jan. 18, 1979, 7901887

Int. Cl.³ A61K *31/415;* **C07D** *233/78*

U.S. Cl. 424—273 R **6 Claims**

1. A compound selected from the group consisting of an alcohol of the formula:

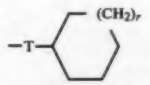


and the pharmaceutically acceptable salts thereof wherein

X is oxygen or sulfur;

R^2 is methyl or ethyl; and

R^3 is alkyl of 4 to 9 carbon atoms or a group of the formula:



in which T is a carbon-carbon bond or methylene and r has a value of 0 to 3.

5. A pharmaceutical composition for the treatment or prophylaxis of bronchoconstriction comprising an effective amount of a compound according to claim 1 together with a pharmaceutically acceptable carrier.

4,413,003

β-HYDROXYARYLETHYLIMIDAZOLES

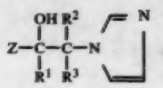
George A. Miller, Maple Glen, and Hak-Foon Chan, Doylestown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 29, 1977, Ser. No. 820,274

Int. Cl.³ A01N *43/50;* **C07D** *233/64*

U.S. Cl. 424—273 R **13 Claims**

1. A compound of the formula



wherein Z is an unsubstituted phenyl or naphthyl group or a phenyl or naphthyl group substituted with up to three substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, $(C_1–C_4)$alkylthio, $(C_1–C_4)$alkylsulfinyl, $(C_1–C_4)$alkylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl and phenoxy, phenylthio, phenylsulfinyl or phenylsulfonyl substituted with up to two substituents selected from the group consisting of halogen, nitro, trifluoromethyl, cyano, methyl, methoxy, methylthio, methylsulfinyl and methylsulfonyl; R^1 is an unsubstituted phenyl or benzyl group or a phenyl or benzyl group substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, methyl, methoxy, methylsulfinyl and methylsulfonyl; and R^2 and R^3 are independently cyano, $(C_2–C_8)$alkenyl, $(C_5–C_8)$cycloalkenyl, $(C_2–C_8)$alkynyl, an unsubstituted phenyl or benzyl group or a phenyl or benzyl group substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, methyl, methoxy, methylsulfinyl and methylsulfonyl; and its agronomically acceptable enantiomorphs, acid addition salts and metal salt complexes thereof.

4,413,004

PHARMACEUTICAL COMPOSITIONS

Andrea Lietti, and Attilio Bonati, both of Milan, Italy, assignors to Inverni Della Beffa S.p.A., Milan, Italy

Division of Ser. No. 881,892, Feb. 27, 1978, Pat. No. 4,376,781, which is a continuation-in-part of Ser. No. 829,913, Sep. 1, 1977, abandoned. This application Nov. 29, 1982, Ser. No. 445,075

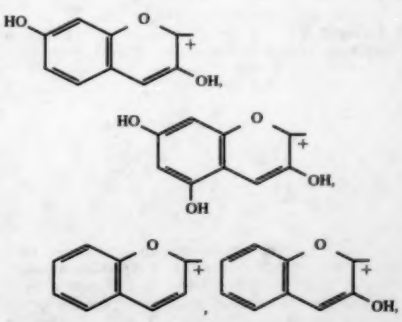
Claims priority, application United Kingdom, Sep. 8, 1976, 37252/76

Int. Cl.³ A61K *31/35*

U.S. Cl. 424—283 **5 Claims**

1. A method of eliciting a vaso-protective response in a subject in need of a vaso-protective response, which comprises administering to the subject an effective dose of a flavylium salt of the structure

containing at least one hydroxy or methoxy substituent and wherein A^+ is selected from the group consisting of



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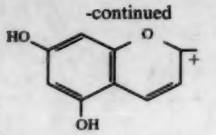
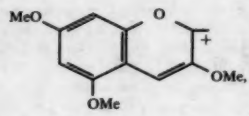
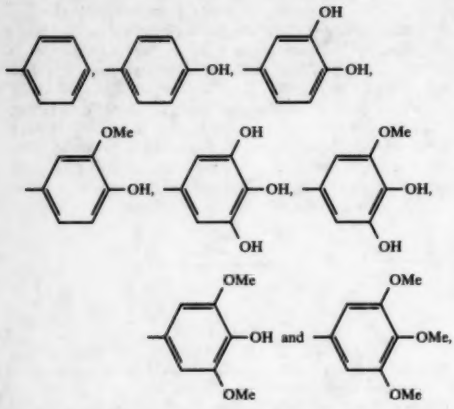


and



B is selected from the group consisting of



and X^- is a pharmaceutically acceptable anion.

4,413,005

CARBAMATE DERIVATIVES AND INSECTICIDAL, MITICIDAL OR NEMATOCIDAL COMPOSITIONS CONTAINING THE SAME

Takeshi Goto, Naruto; Hisashi Takao, Tokushima; Takashi Soeda, Naruto; Nobuyoshi Asai; Sadahiko Iida, both of Tokushima; Mitsuyasu Kawata, Naruto; Norio Osaki, Naruto; Norio Yasudomi, Naruto; Tadateru Murata, Tokushima, and Akira Tanaka, Naruto, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

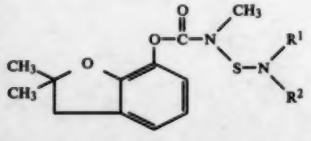
Filed Feb. 26, 1982, Ser. No. 352,862

Claims priority, application Japan, Jun. 2, 1981, 56-85093; Jun. 2, 1981, 56-85094; Aug. 7, 1981, 56-124422; Aug. 7, 1981, 56-124423

Int. Cl.³ A01N *47/24*; C07D *307/86*

U.S. Cl. 424—285 **12 Claims**

1. A carbamate derivative represented by the formula (I):



(I)

wherein R^1 and R^2, which may be the same or different, each represents (1) —X—$COOR^3$, in which X represents an alkylene group having 1 to 6 carbon atoms, and R^3 represents an alkyl group having 1 to 8 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms; or (2) —Y—CN, in which Y represents an alkylene group having 1 to 6 carbon atoms; and R^2 further represents an alkyl group having 1 to 8 carbon atoms; a cycloalkyl group having 3 to 6 carbon atoms; a benzyl group which may be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms; a phenyl group which may be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms; or —Z—R^4, in which Z represents a carbonyl group or a sulfonyl group, and R^4 represents an alkyl group having 1 to 6 carbon atoms which may be substituted with a halogen atom, a phenyl group which may be substituted with a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 3 carbon atoms, a benzyl group, an alkoxy group having 1 to 6 carbon atoms or a phenoxy group.

11. A method for controlling noxious insects, mites or nematodes applying thereto an insecticidally, miticidally, or nematocidally effective amount of the carbamate derivative according to claim 1.

4,413,006

N-ARYL-N-PHENOXY-ALKYL-PIPERAZINE COMPOUNDS USEFUL IN DECREASING INTRACRANIAL PRESSURE

Takeshi Kanno; Mitsunori Gaino, both of Omiya; Michio Yamamura, Tondabayashi; Ryuichi Ishida, and Keiichi Shintomi, both of Suita, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

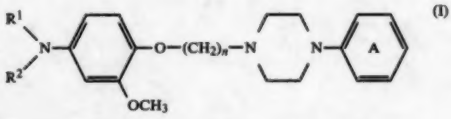
Division of Ser. No. 231,094, Feb. 3, 1981, abandoned. This application May 3, 1982, Ser. No. 374,106

Claims priority, application Japan, Feb. 18, 1980, 55-18855

Int. Cl.³ C07D *295/00*; A01N *43/48*; A61K *31/495*; C07D *403/00, 241/04*

U.S. Cl. 424—250 **19 Claims**

1. A method of reducing increased intracranial pressure in a warm-blooded animal which comprises administering to a warm-blooded animal in need of such reduction of intracranial pressure a therapeutically effective amount of a piperazine compound of the formula:



(I)

wherein R^1 is hydrogen, alkyl (C_{1-8}), alkyl (C_{1-4})-sulfonyl or an acyl group of the formula: R^3CO— (wherein R^3 is hydrogen, alkyl (C_{1-7}), halogenoalkyl (C_{1-4}), alkoxy (C_{1-4})-carbonyl-alkyl (C_{1-4}), cycloalkyl (C_{3-6}), alkenyl (C_{2-5}), alkoxy (C_{1-4}), amino, alkyl (C_{1-4})-amino or anilino), R^2 is hydrogen, alkyl (C_{1-4}), alkoxy (C_{1-4})-carbonyl-alkyl (C_{1-4}), carboxy-alkyl (C_{1-4}), alkenyl (C_{2-5}) or alkyl (C_{1-4})-sulfonyl, or R^1 and R^2 are combined together to form succinyl group, Ring A is phenyl, alkyl (C_{1-4})-phenyl or halogenophenyl, and n is an integer of 2 to 6, or a pharmaceutically acceptable acid addition salt thereof.

4,413,007

PESTICIDAL SYMMETRICAL N-SUBSTITUTED BIS-CARBAMOYLOXIMINO DISULFIDE COMPOUNDS

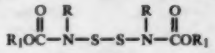
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 781,997, Mar. 28, 1977, Pat. No. 4,327,110. This application Aug. 18, 1978, Ser. No. 934,973

Int. Cl.³ A01N *33/02*; C07C *121/50, 125/06, 119/20*

U.S. Cl. 424—298 **29 Claims**

1. A compound of the formula:

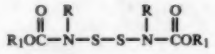


wherein:
R is alkyl having from 1 to 4 carbon atoms;
R_1 is:

wherein:
R_2 is hydrogen, chloro, cyano, alkyl, alkylthio, cyanoalkylthio;
R_3 is alkyl, alkylthio, alkoxy, alkanoyl, benzoyl alkoxycarbonyl, alkylsulfinyl, alkylsulfonyl, alkenyl, alkynyl or phenyl all of which may be substituted with one or more cyano, nitro, fluoro, bromo, chloro, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, phenoxy, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl or

wherein:
R_4 is hydrogen or alkyl;
R_5 is hydrogen, alkyl, alkoxy or alkylthio;
with the proviso that R_2, R_3, R_4 and R_5 substituents individually may not include more than eight aliphatic carbon atoms.

9. An insecticidal, miticidal and nematocidal composition comprising an acceptable carrier and as the active toxicant and insecticidally, miticidally or nematocidally effective amount of a compound of the formula:



wherein:
R is alkyl having from 1 to 4 carbon atoms;
R_1 is

wherein:
R_2 is hydrogen, chloro, cyano, alkyl, alkylthio, cyanoalkylthio;
R_3 is alkyl, alkylthio, alkoxy, alkanoyl, benzoyl, alkoxycarbonyl, alkylsulfinyl, alkylsulfonyl, alkenyl, alkynyl or phenyl all of which may be substituted with one or more cyano, nitro, fluoro, bromo, chloro, alkylthio, alkylsulfinyl, alkylsulfonyl, alkoxy, phenoxy, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl or

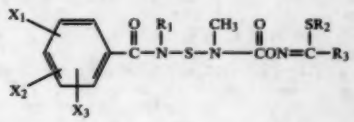
wherein:
R_4 is hydrogen or alkyl;
R_5 is hydrogen, alkyl, alkoxy or alkylthio;
with the proviso that R_2, R_3, R_4 and R_5 individually may not include more than eight aliphatic carbon atoms.

4,413,008
THIOHYDROXIMIDIC ACID ESTERS AND INSECTICIDAL USE THEREOF

Jozef Drabek, Oberwil, Switzerland, and Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,306
Int. Cl.³ C07C 119/20; A01N 37/52
U.S. Cl. 424—298 **8 Claims**

1. A compound of the formula



wherein
R_1 is alkyl of 1 to 10 carbon atoms;
R_2 is alkyl of 1 to 3 carbon atoms or allyl;
R_3 is methyl, —$CONH_2$ or —$CON(CH_3)_2$; and
each of X_1, X_2 and X_3, independently of the others, is hydrogen, halo, alkyl of 1 to 4 carbon atoms or haloalkyl of 1 to 4 carbon atoms.

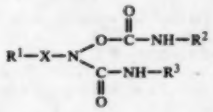
7. A pesticidal composition for the control of insects, mites, and ticks which comprises an effective amount of a compound according to claim 1 in combination with a carrier therefor.

4,413,009
N-((ALKYLAMINO)CARBONYL)-N-(((ALKYLAMINO)-CARBONYL)OXY)ACYLAMIDES WITH ANTINEOPLASTIC ACTIVITY

Walter Reifschneider, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1982, Ser. No. 349,502
Int. Cl.³ A61K 31/215, 31/325
U.S. Cl. 424—298 **8 Claims**

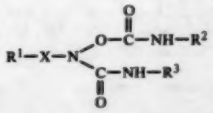
1. A composition useful for inhibiting the growth of P_{388} leukemia or MX-1 carcinoma comprising a pharmaceutically-acceptable carrier in combination with an effective P_{388} leukemia or MX-1 carcinoma inhibiting amount of a compound corresponding to the formula



(I)

wherein R^1, R^2 and R^3 may each independently represent hydrogen, alkyl of 1 to 4 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, phenyl or phenyl substituted with from 1 to 5 alkyl groups of 1 to 4 carbon atoms and X represents carbonyl or sulfonyl.

5. A method for inhibiting the growth of P_{388} leukemia or MX-1 carcinoma in a mammal afflicted therewith which comprises administering to said mammal, in an amount effective to inhibit said growth, a compound corresponding to the formula



(I)

wherein R^1, R^2 and R^3 may each independently represent hydrogen, alkyl of 1 to 4 carbon atoms, cycloalkyl of from 3 to

6 carbon atoms, phenyl or phenyl substituted with from 1 to 5 alkyl groups of 1 to 4 carbon atoms and X represents carbonyl or sulfonyl in admixture with a pharmaceutically-acceptable carrier therefor.

4,413,010

CARBAMIC ACID ESTERS AND USE AS PESTICIDES

Rene Zurflüh, Bülach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 14, 1981, Ser. No. 301,612
Claims priority, application Switzerland, Sep. 23, 1980, 7120/80; Jun. 30, 1981, 4307/81
Int. Cl.³ A01N *47/10*; C07C *125/06*
U.S. Cl. 424—300 6 Claims

1. Ethyl [2-(p-phenoxyphenoxy)ethyl]methylcarbamate.

3. A pesticidal composition which comprises an inert carrier material and, as the active ingredient, an amount which is effective as a pesticide of a compound according to claim 1.

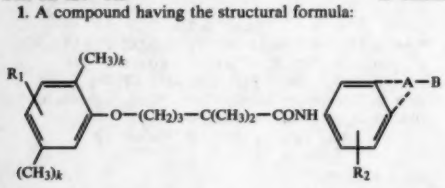
4,413,011

SUBSTITUTED 2,2-DIMETHYL-5-PHENOXYPENTANOIC ACID BENZAMIDES AS ANTI-ARTERIOSCLEROTIC AGENTS AND METHOD

Ila Sircar, Ann Arbor, and Ann Holmes, Dexter, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 26, 1981, Ser. No. 238,398
Int. Cl.³ A61K *31/24*, *31/19*; C07C *63/52*, *69/76*
U.S. Cl. 424—309 19 Claims

1. A compound having the structural formula:



wherein R_1 is hydrogen, hydroxy, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, benzyloxy or trifluoromethyl; $R_2$is hydrogen, hydroxy, halogen, alkyl of from 1 to 6 carbon atoms or alkoxy of from 1 to 6 carbon atoms; A is $(CH_2)_m$ wherein m is an integer of from 1 to 3, or $CR_4{=}CR_5$ wherein R_4 and R_5 are trans to each other and are hydrogen or alkyl of from 1 to 6 carbon atoms, and the dotted lines indicate the presence of only one substituent which must be located at one of the specified positions; B is

CO_2X wherein X is hydrogen, alkyl of from 1 to 6 carbon atoms, ammonium or a pharmaceutically acceptable metal or organic amine cation;

k is 0 or 1 with the proviso that when k is 0, R_1 may not be alkyl of from 1 to 6 carbon atoms and when k is 1, R_1 must be in the 4-position.

13. The compound defined in claim 1 which is ethyl 3-[4-[[5-(2,5-dimethylphenoxy)-2,2-dimethyl-1-oxopentyl]amino]-3-hydroxyphenyl]-2-propenoate.

4,413,012

METHOD FOR TREATING DEPRESSION

Michael G. Palfreyman, Fegersheim, and Ian A. McDonald, Truchtersheim, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Division of Ser. No. 268,554, Jun. 1, 1981, Pat. No. 4,346,110. This application May 26, 1982, Ser. No. 382,264
Int. Cl.³ A61K *31/15*, *31/24*, *31/195*
U.S. Cl. 424—319 9 Claims

1. A method for treating depression which comprises administering to a depressed patient an antidepressant effective amount of 2-amino-3-(3'-hydroxyphenyl)-3-butenoic acid or 2-amino-3-(3',4'-dimethoxyphenyl)-3-butenoic acid, or a (C_1–C_8) alkyl ester thereof or a pharmaceutically acceptable salt thereof; in combination with an AADC inhibitor selected from carbidopa, benserazide, or a 2-amino-3-(monofluoromethyl or difluoromethyl)-3-(monohydroxyphenyl or dihydroxyphenyl)-propionic acid, the amount of said AADC inhibitor being effective to substantially block the AADC catalyzed decarboxylation of said antidepressant compound extracerebrally without substantially blocking the AADC catalyzed decarboxylation of said antidepressant compound in the brain.

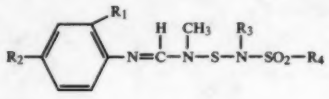
4,413,013

SULFONAMIDE COMPOUNDS, COMPOSITIONS AND METHODS FOR COMBATTING INSECTS

Victor L. Rizzo, Almena Township, Van Buren County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 51,258, Jun. 22, 1979, abandoned, which is a continuation of Ser. No. 898,570, Apr. 21, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,740
Int. Cl.³ A01N *9/16*; C07C *143/75*, *143/79*
U.S. Cl. 424—321 39 Claims

1. A compound of the formula



(1)

wherein

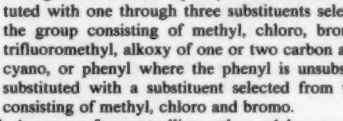
R_1 is chloro, bromo, or alkyl of one through four carbon atoms;

R_2 is hydrogen, chloro, bromo, or alkyl of one through four carbon atoms;

R_3 is phenalkyl wherein alkyl is one or two methylene units in length, or phenyl where the phenyl is unsubstituted or substituted with one through three substituents selected from the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of one or two carbon atoms, and cyano; and

R_4 is phenalkyl wherein alkyl is one or two methylene units in length and where the phenyl is unsubstituted or substituted with one through three substituents selected from the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of one or two carbon atoms, and cyano, or phenyl where the phenyl is unsubstituted or substituted with a substituent selected from the group consisting of methyl, chloro and bromo.

13. A process for controlling arthropodal pest populations which comprises applying to a situs an effective amount of a compound of the formula:



(1)

wherein

R_1 is chloro, bromo, or alkyl of one through four carbon atoms;

R_2 is hydrogen, chloro, bromo, or alkyl of one through four carbon atoms;

R_3 is phenalkyl wherein alkyl is one or two methylene units in length, or phenyl where the phenyl is unsubstituted or substituted with one through three substituents selected from the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of one or two carbon atoms, and cyano; and

R_4 is phenalkyl wherein alkyl is one or two methylene units in length and where the phenyl is unsubstituted or substituted with one through three substituents selected from

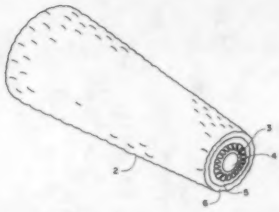
the group consisting of methyl, chloro, bromo, nitro, trifluoromethyl, alkoxy of one or two carbon atoms, and cyano, or phenyl where the phenyl is unsubstituted or substituted with a substituent selected from the group consisting of methyl, chloro and bromo.

4,413,014

FISH BAIT AND METHOD OF MANUFACTURING THE SAME

Ronald D. Melancon, 1604 E. Bridge, Breaux Bridge, La. 70517

Filed Feb. 26, 1981, Ser. No. 238,544
Int. Cl.³ A23K *1/18;* A23B *7/16*
U.S. Cl. 426—1 7 Claims



1. A process for manufacturing articles for consumption by fish, which comprises:

saturating a dried ear of corn with a fish attractant liquid wherein said fish attractant material includes salt and blood, forming a cavity in the central portion of said ear of corn and filling said cavity with an edible solid.

4,413,015

STORAGE STABLE WATER-DILUTABLE ACID ADDUCTED EPOXY BASED COATING FOR METAL FOOD CONTACT SURFACES

Ronald W. Anderson, Allison Park, and Richard A. Lamanna, McMurray, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 50,722, Jun. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 828,584, Aug. 29, 1977, abandoned. This application May 11, 1981, Ser. No. 262,088
Int. Cl.³ A21D *10/02*
U.S. Cl. 426—131 19 Claims

1. A water-solubilizable resin prepared in the absence of dicarboxylic acid consisting essentially of (A) an adduct of a monocarboxylic acid having between 8 and 18 carbon atoms and a diglycidyl ether of a bisphenol, or (B) of a monocarboxylic acid having between 8 and 18 carbon atoms, a bisphenol, and a diglycidyl ether of a bisphenol, in an equivalent ratio of total monocarboxylic acid and bisphenol, to diglycidyl ether between about 1:1 and about 1.2:1; (A) or (B) being further adducted with an anhydride selected from the group consisting of trimellitic anhydride, succinic anhydride, methyl succinic anhydride, tricarballylic anhydride, phthalic anhydride, hexahydrophthalic anhydride, and maleic anhydride, in an amount sufficient to provide an acid number between about 35 and about 150.

9. A coating composition comprising the resin of claim 1 and an aminoplast, in a weight ratio between about 95:5 and about 70:30 solubilized with a volatile tertiary amine, ammonia, or ammonium hydroxide to a pH of about 7.0 to about 9.1 in at least one solvent of the group of alcohols, having between about 2 and about 8 carbon atoms, alkoxyethanols, ketones, and alkyl ethers of diethylene glycol, each present in between about one weight percent and about 20 weight percent of the weight of the final composition, and diluted with water to a solids content between about 10 weight percent and about 25 weight percent.

16. A metal food packaging container interior coated with the coating composition of claim 9 and baked, containing food or beverage.

4,413,016

PELLET DIE

Leroy V. Skoch, Glencoe, and Keith E. Pike, Washington, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Division of Ser. No. 268,036, May 28, 1981, Pat. No. 4,380,424. This application Jul. 19, 1982, Ser. No. 399,551
Int. Cl.³ A01N *35/00*
U.S. Cl. 426—454 10 Claims

1. A method of pelleting animal feeds having improved production efficiency with good pellet quality comprising:

(a) heat conditioning the feed at a moisture level of between about 17 to 21% by weight and a temperature above about 200° F.

(b) pelleting said feed by passing through a die having a compression and discharge side, and at least one die hole extending through said die, having a countersink on the compression side, said die hole having a working section for pellet formation, said section having a diameter that defines pellet size and a length that defines the effective thickness for the die hole, said die hole having a ratio of effective thickness to countersink diameter which is at least about 1.8 to 1 and a countersink diameter which is at least about 137% of the working section diameter.

4,413,017

FOOD PRODUCT CONTAINING JUICE PULP AND ACIDIFIED MILK COMPONENTS

Mary A. Loader, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Jun. 11, 1981, Ser. No. 272,446
Int. Cl.³ A23L *1/187, 1/212, 1/34;* A23C *23/00*
U.S. Cl. 426—616 14 Claims

1. A food composition having a pudding-like texture consisting essentially of a pasteurized, uniform blend of:

A. from about 42% to 55% by weight (wet basis) is dated, washed, homogenized raw juice pulp whose water content has not been reduced by thermal and/or mechanical means;

B. from about 11% to 15% of sour cream on a solids basis;

C. from about 5% to 15% by weight of a nutritive carbohydrate sweetening agent;

D. sufficient edible organic acid to provide the food composition with a pH of about 3.0 to about 4.5; and

E. sufficient moisture to have a water content ranging from about 65% to 85% by weight; and wherein said blend has a viscosity of 7,000 to 18,000 cp. at 40°±2° F.

4,413,018

METHOD FOR PREPARING WHOLE GRAIN OAT PRODUCT

Francis Webster, Crystal Lake, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jun. 1, 1981, Ser. No. 268,927
Int. Cl.³ A23B *9/00;* A23L *1/172*
U.S. Cl. 426—618 7 Claims

1. A method for preparing quick-cooking oats, in whole form, comprising the steps of:

a. conditioning dehulled uncut, unrolled oats, by indirect steam heat at a temperature in the range approximately 170°–220° F. until the moisture level of the oats is approximately 7–8% based on the weight of the oats to yield conditioned oats, in whole form;

b. tempering the conditioned oats by a method selected from the group consisting of steaming or boiling in water, to yield tempered oats, in whole form, having a moisture

content in the range 12–35% by weight based on the weight of the oats; and

c. drying and toasting the tempered oats at a temperature insufficient to oxidize the oat lipids but sufficient to reduce the moisture content of the oats to a moisture in the range 5–8% inclusive;

thereby producing a quick-cooking oat product in which the oats are in whole form.

4,413,019

RADIATION CURABLE ADHESIVE COMPOSITIONS AND COMPOSITE STRUCTURES

Walter Brenner, Teaneck, N.J., assignor to The Standard Products Company, Dearborn, Mich.

Division of Ser. No. 45,863, Jun. 6, 1979, Pat. No. 4,319,942. This application Dec. 2, 1981, Ser. No. 326,904

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—36 **5 Claims**

1. A method of curing an adhesive composition on a rubber substrate which comprises:

providing a rubber substrate,

coating said rubber substrate with a solvent-free adhesive composition comprised of an elastomer, an ethylenically unsaturated polymerizable monomer, a tackifier, and an adhesion promoter,

depositing flock on the top side of the adhesive coated rubber substrate, and

exposing the composite to high energy ionizing radiation to effect a cure of said adhesive.

4,413,020

DEVICE FABRICATION INCORPORATING LIQUID ASSISTED LASER PATTERNING OF METALLIZATION

William R. McKee, Plano; Russell H. Murdock, and Eric F. Schulte, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 1, 1982, Ser. No. 344,446

Int. Cl.³ B05D *3/06, 5/12;* **B23K** *9/00*

U.S. Cl. 427—53.1 **7 Claims**

3. A method for patterning metal in an integrated circuit, comprising the steps of:

providing a substrate having a layer of metal to be patterned on a surface thereof;

maintaining a thin film of liquid in direct contact with said layer of metal to be patterned, for confinement and collection of removed metal; and

subjecting said metal and overlying liquid film to a laser process for removing areas of metal not wanted.

4,413,021

PROCESS FOR BRINGING LIQUIDS INTO CONTACT

Klaus Heatschel, Vosswaldestrasse 5, 6450 Hanua 9; Friedrich Bittner, Mozartstrasse 38, 6232 Bad Soden; Gerd Schreyer, Wildaustrasse 22, 6450 Hanau 9, and Georg Franz, Erbstadter Strasse 4, 6369 Niederau 1, all of Fed. Rep. of Germany

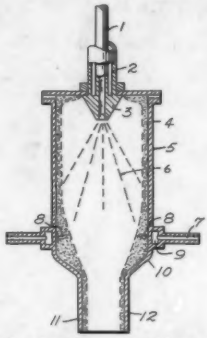
Division of Ser. No. 94,803, Nov. 15, 1979, Pat. No. 4,377,344. This application Aug. 17, 1982, Ser. No. 408,923

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1978, 2850271

Int. Cl.³ B05D *1/02, 1/34, 7/22*

U.S. Cl. 427—236 **7 Claims**

1. A process for the production of a suspension or solution by mixing a plurality of liquids at least one of which is a viscous liquid comprising providing an apparatus comprising a tubular container having a first spray nozzle means in the upper portion of the container and at least one other nozzle means in the form of tangential spray means lower than said first spray nozzle means, said tubular container being closeable at the top and being constricted in breast shaped manner slightly downwardly from said other nozzle means to form a discharge opening, said constriction being in the form of a flat S curve going from the wall of the tubular container to the discharge



opening, introducing the viscous liquid through said first spray nozzle means into the container, spraying at least one other liquid through said other tangential nozzle means and into said tubular container in the direction of said first spray nozzle means to form a liquid layer on the wall of the container which is thickest in the region of the breast shaped constriction.

4,413,022

METHOD FOR PERFORMING GROWTH OF COMPOUND THIN FILMS

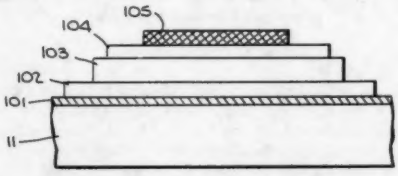
Tuomo S. Suntola; Arto J. Pakkala, and Sven G. Lindfors, all of Espoo, Finland, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1979, Ser. No. 50,606

Claims priority, application Finland, Feb. 28, 1979, 790680

Int. Cl.³ C23C *11/00, 13/00*

U.S. Cl. 427—255.2 **5 Claims**



1. A method of growing a compound thin film of different elements on a substrate surface by providing alternate surface reactions, in a single chamber, of different substances respectively containing said different elements, comprising the steps of supplying vapors of said substances repeatedly and alternately to a chamber housing said substrate, supplying a gas phase medium to said chamber at least during periods between the alternate supply of said substances, wherein said vapors react with the surfaces of the substrate to produce a film, said vapors alternately and subsequently reacting with the film to cause said film to grow to provide a solid state product at the temperature of said substrate surface, and wherein the supply of said gas phase medium alternately voids the chamber of each of said substances thereby substantially preventing a simultaneous interaction of said alternately supplied vapors

during the growth of said compound thin film on said substrate.

4,413,023

METHOD OF TREATING WOOD TO PREVENT STAIN AND DECAY

Suezone Chow, Richmond, Canada, assignor to Canadian Forest Products Ltd., Canada

Filed Feb. 11, 1982, Ser. No. 347,804

Claims priority, application Canada, Aug. 28, 1981, 384798

Int. Cl.³ B05D *1/18, 3/00, 3/12*

U.S. Cl. 427—325 **8 Claims**

1. A method of treating wood to prevent stain and decay comprising:

(a) extracting from a decay resistant species of wood material fungi growth inhibiting material;

(b) wetting the surface of wood to be treated with a solution of the extracted material.

4,413,024

METHOD FOR CHEMICAL TREATMENT OF WOODS

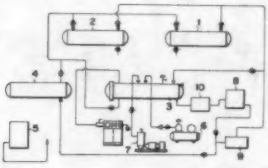
Hideo Miyata, Shizuoka, and Hitoshi Ishii, Yaizu, both of Japan, assignors to Fuji Kogyo Company, Limited, Shizuoka, Japan

Filed Nov. 21, 1980, Ser. No. 209,303

Claims priority, application Japan, Mar. 17, 1980, 55-34409; Aug. 28, 1980, 55-118778

Int. Cl.³ B05D *1/18, 3/12*

U.S. Cl. 427—370 **8 Claims**



1. A method of treating timber with chemicals, comprising the steps of:

introducing into a pressure vessel, in which timber has been placed, such an amount of a solution of chemicals that permits all of the timber to be soaked therein, with an empty space of a small height in an upper portion of the interior of the pressure vessel;

heating the timber and solution of chemicals in the pressure vessel to a temperature which is not less than about 100° C., and no higher than that temperature at which high-temperature trouble, such as discoloration, begins to occur on the timber; and

pneumatically increasing the pressure in said empty space in the upper portion of the interior of the pressure vessel to a level greater than that of the pressure of saturated steam at that temperature to which said timber and solution are heated in said heating step, to allow the chemicals to be permeated into the timber.

4,413,025

COATING COMPOSITION FOR POLYCARBONATE MOLDINGS CONTAINING PARTIALLY HYDROLYZED ALKYLTRIALKOXYSILANE AND POLYVINYLBUTYRAL

Mitsunobu Haga, and Yasuzi Omori, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Oct. 20, 1981, Ser. No. 313,130

Claims priority, application Japan, Nov. 12, 1980, 55-159317

Int. Cl.³ C08L *83/06;* **B05D** *3/02*

U.S. Cl. 427—387 **10 Claims**

1. A coating composition which is curable to provide a tenacious, transparent, mar-resistant, flexible coating on a polycarbonate molding, which comprises a mixture of

(A) 100 parts by weight of an organic-solvent-soluble, partially hydrolyzed condensate of an alkyltrialkoxysilane having the formula

$$R^1Si(OR^2)_3$$

wherein R^1 is alkyl having 1 to 4 carbon atoms and R^2 is alkyl having 1 to 4 carbon atoms, said condensate being free of tetraalkoxysilanes and copolycondensates of tetraalkoxysilanes, and

(B) 0.5 to 6 parts by weight of polyvinylbutyral resin.

4,413,026

METHOD FOR WEATHERPROOFING SUBSTRATES

Stanley A. Sherno, Columbia, S.C., assignor to Aperm of South Carolina, Greenwood, S.C.

Continuation of Ser. No. 279,062, Jun. 30, 1981, abandoned, which is a division of Ser. No. 129,249, Mar. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 103,438, Dec. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 41,592, May 23, 1979, abandoned. This application Jul. 7, 1982, Ser. No. 395,956

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—407.1 **13 Claims**

1. A method of providing a weatherproof coating on an exterior surface which comprises providing an aqueous coating composition comprising an aqueous thermoplastic synthetic resin latex prepared by emulsion polymerization and capable of forming a film, and dispersed therewith, a plurality of discrete multicellular particles of foamed polystyrene, said particles having a particle size of 0.03 to 0.3 inch and a thickening agent, the resin latex being present in an amount of 2–60 parts by volume of resin solids per 100 parts by volume of polystyrene particles, and said thickening agent being present in an amount sufficient to increase the viscosity of the aqueous coating composition to a paint-like consistency, applying the aqueous composition onto said exterior surface, and permitting water to evaporate from the coating whereby there is formed a tenaciously adherent, weatherproof, lightweight, heat insulating coating on said exterior surface, said coating having a thickness of about 30 mils to one inch comprising said polystyrene particles and from 2–60 parts by volume of said latex resin per 100 parts by volume of said polystyrene particles.

2. A method according to claim 1 wherein the composition is applied a plurality of times.

3. A method according to claim 2 wherein a first application of said composition has a relatively low content of resin latex and a subsequent application thereof has a relatively high content of resin latex.

4,413,027

PROTECTIVE AND DECORATIVE MOLDING

Horst Bildl, Fürth, Fed. Rep. of Germany, assignor to Rehau Plastiks A.G. & Co., Rehau, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,575

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020037

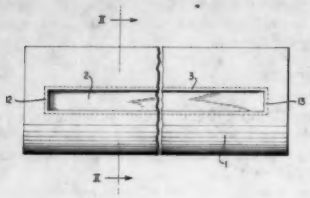
Int. Cl.³ B32B *3/30;* **B60R** *13/04*

U.S. Cl. 428—31 **5 Claims**

1. A molding comprising

(a) a one-piece elongated plastic molding body having a length and opposite ends bounding said length; said molding body including an elongated, channel-like recess having opposite ends situated at a distance from respective said opposite ends of said molding body; said recess having a bottom, longitudinal side walls, end walls and an open top; said molding body further including lips surrounding said recess at the top; said lips defining a closed perimeter of said recess and reducing the area of opening of said recess at the top; and

(b) an elongated metal strip received in said recess; said strip having an outer face and a marginal zone extending in a



closed line on said outer face; said lips extending over and engaging said marginal zone of said metal strip in its entirety.

4,413,028

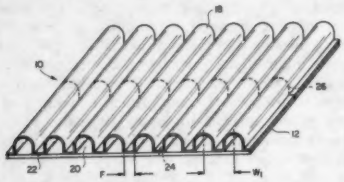
MASS CONNECTOR DEVICE

Stephen H. Diaz, Los Altos Hills, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 172,897, Jul. 28, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 341,427

Int. Cl.³ H01R *4/00;* H02G *13/06*

U.S. Cl. 428—36 **34 Claims**



1. A connector device for connecting substrates, which comprises:

a first sheet having an original dimensionally stable shape;

a second sheet having an original heat-stable shape, said shape being expanded relative to said first sheet to a second heat-unstable shape and thereafter being formed into alternate working and bonding zones, said working and bonding zones having horizontal center lines;

inserts positioned between said first and second sheets at least within said working zones;

said sheets being such that they will not melt at a temperature high enough to activate said inserts, and

said sheets being bonded together at the bonding zones, whereby application of heat causes the working zones to conform to substrates to be connected when the substrates are inserted therein while said first sheet maintains the original center line spacing of the working zones.

4,413,029

PROTECTIVE COVER FOR PILE OF PARTICULATE MATERIAL

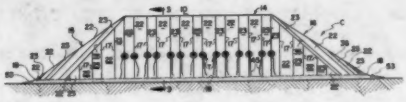
Gary R. Handwerker, Glencoe, Ill., assignor to Midwest Canvas Corp., Chicago, Ill.

Filed Mar. 8, 1982, Ser. No. 356,251

Int. Cl.³ E04D *1/34;* B32B *3/06*

U.S. Cl. 428—61 **14 Claims**

1. A protective cover for a pile of particulate material having an apex and a base and sides sloping downwardly and outwardly from said apex toward the perimeter of said base, said cover comprising a plurality of elongated panels adapted to overlie said pile and extend lengthwise between the apex and perimeter of said base, the laterally spaced, side edges of said panels being joined together by seams that are adapted to extend substantially perpendicularly to the perimeter of said base, and some of said panels being porous to gas and substan-



tially nonporous to liquid and other of said panels being substantially nonporous to both gas and liquid.

4,413,030

FIBER AGGREGATE

Günter Tesch, Fribourg, and Siegfried Gieldanowski, Schmitten, both of Switzerland, assignors to Breveteam S.A., Fribourg, Switzerland

Continuation of Ser. No. 109,304, Jan. 3, 1980, abandoned. This application May 26, 1981, Ser. No. 266,921

Claims priority, application Switzerland, Jan. 9, 1979, 157/79

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—85 **13 Claims**

1. A fiber aggregate being unconnected to any other fiber aggregate prior to needle processing and having a smallest diameter of 3 mm. and comprising fibers, each fiber having a length of at least 15 mm., at least some of said fibers being intertwined to form a body of a substantially spherical to an elongate shape, and said body having a density ranging from about 0.01 to about 0.1 grams per cubic centimeter, the intertwining being such that a needle commonly used in needle processing technology to stitch materials together may penetrate said body and grip and withdraw any fiber from said body free from encountering any substantial resistance so that the pulled length would extend out of the body without losing its cohesion with the body.

4,413,031

MULTI-LAYER PLATE OF LIGNOCELLULOSE-CONTAINING PARTICLES PROVIDED WITH AT LEAST ONE BINDER

Klaus Poppelreuter, Springe, Fed. Rep. of Germany, assignor to Bison-Werke Bähre & Greten GmbH & Co. KG, Springe, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 302,193

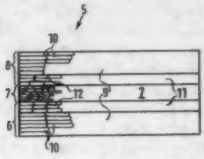
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3034772

Int. Cl.³ B32B *7/02*

U.S. Cl. 428—212 **3 Claims**

1. Plate having several layers of a pressed fleece, said fleece having two outer cover layers of preferably lignocellulose-

containing slender oriented particles mixed with at least one binder material, at least in a region of the cover layer facing



away from the center layer the length of the slender particles increasing with their distance from the center layer.

4,413,032

NON-WOVEN FABRIC WITH WICK ACTION

Ludwig Hartmann, and Ivo Ruzek, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Carl Freudenberg, Fed. Rep. of Germany

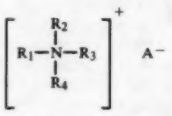
Filed Oct. 6, 1981, Ser. No. 309,223

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044631

Int. Cl.³ D04H *1/58*

U.S. Cl. 428—288 **5 Claims**

1. A non-woven fabric covering for absorbent cellulose material which comprises a surface-treated non-woven fabric, having a wick action, made up from synthetic fibers which are surface treated with an effective amount of a wetting agent, said wetting agent being capable of being chemisorbed on cellulose, said wetting agent being a cationic surfactant which causes a rapid transport of liquid to the absorbent cellulose materials while substantially blocking the return of the liquid to the fabric covering, said cationic surfactant having the formula:



wherein R_1 to R_4 are chosen from the group consisting of alkyl of 1 to 20 carbon atoms, aryl, alkylaryl having 1 to 20 carbon atoms in the alkyl group, ethoxy, alkylethoxy having 1 to 20 carbon atoms in the alkyl group, arylethoxy, or alkylarylethoxy having 1 to 20 carbon atoms in the alkyl group, and A is an anion.

4,413,033

WIRE CARRIER AND EDGE PROTECTOR TRIM STRIP FORMED THEREFROM

Edward C. Weichman, Rock Hill, S.C., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,798

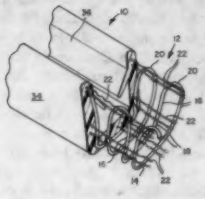
Int. Cl.³ E04F *19/02*; E06B *7/22*

U.S. Cl. 428—122 **2 Claims**

1. A bendable substantially U-shaped wire carrier for use in forming an edge protector trim strip when coated with an elastomeric material comprising:

a continuous metallic wire looped to form looped ends at the edges of said U-shaped carrier, said looped ends being joined by lengths of wire extending transversely and spaced from one another longitudinally of said carrier, each of said lengths of wire forming a base and side flanges joined by substantially right angle corners;

a plurality of strands of material extending longitudinally of said carrier and selectively interwoven with said base and side flanges only of said wires to maintain the spaced relation thereof with said corners free of strands; and



at least two of said strands being located along said looped ends at each edge of said carrier and forced together by the curvature of said looped ends to form at least a pair of grouped edge strands.

4,413,034

RECORD HANDLER

Chester L. Anderson, 5712 Manor Rd., P.O. Box 12, Austin, Tex. 78723

Filed Mar. 2, 1982, Ser. No. 353,956

Int. Cl.³ B32B *3/00, 27/00*; D04H *1/58*

U.S. Cl. 428—172 **2 Claims**

1. A record handler, comprising, in combination, a flat pad formed by a layer of plastic vinyl material on one side thereof and a layer of soft felt material on its other side, said layers being bonded together, a fold line across said pad for folding over said pad with said soft felt material being located on a folded over inner side thereof, a plurality of finger and thumb receiving straps formed on said plastic vinyl layer, said straps being located at both opposite sides from said fold line, and a strip of soft rubber impregnated on a surface of said soft felt along said fold line for frictionally grasping an edge of said phonograph record disc when said holder is folded thereabout, said soft rubber strip having a plurality of raised transverse ridges.

4,413,035

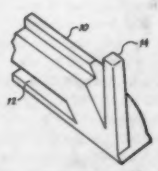
FRAMING ASSEMBLY

Albert A. DiIoia, 2594 Carrell La., Willow Grove, Pa. 19090

Filed Nov. 25, 1981, Ser. No. 324,641

Int. Cl.³ G09F *1/12*; A47G *1/08*

U.S. Cl. 428—397 **1 Claim**



1. A framing kit comprising the combination of four molded elongated plastic members each of which is mitered on at least

one end(,) and having a tabular member of essentially rectangular cross section oriented perpendicularly with respect to the longitudinal axis of each said elongated member and projecting from the mitered end thereof, all four sides of said tabular member being of substantially equal dimension, a groove of essentially the same cross sectional dimensions as said tabular member and extending substantially the entire length of said elongated member, and a mitering guide for assisting in the cutting of each of said elongated members to a desired length and for providing each such member with a mitered surface which angularly relates to a cooperating one of said longitudinal members, said mitering guide comprising a tabular projection of substantially the same dimensions as those of the tabular projection of said elongated member, said mitering guide further comprising a guide portion attached to said tabular projection and angularly oriented with respect to said tabular projection such that when said tabular projection is positioned within the groove of one of said elongated members said mitering guide may be readily shifted to any desired position along said elongated member thereby enabling said elongated member to be cut to any desired length at a mitered angle which cooperatively relates to the mitered end of said longitudinal members, whereby said four longitudinal members after being cut to their desired length are joined together by inserting the tabular projection of one such longitudinal member into the groove of an adjacent longitudinal member to complete the fabrication of a frame of desired dimension.

4,413,036

TWO-LAYER METAL-EFFECT COATING AND A PROCESS FOR ITS PRODUCTION

Hermann-Josef Drexler, Guntersleben, and Ulrich Poth, Münster, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern A.G., Hamburg, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,405

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041648

Int. Cl.³ B32B *9/02;* **B05D** *1/36;* **C09D** *5/38*

U.S. Cl. 428—458 **28 Claims**

1. In an article having a substrate and a two-layer metal-effect coating adhered thereto, said coating comprising a base layer which contains metal pigments and a clear top coating, the improvement comprising at least said base layer obtained from a coating composition containing as a film-forming binder a polymer resin obtained by a copolymerizing olefinically unsaturated compounds wherein said polymer resin is a copolymerization product of:

(a) 1.0 to 50.0% by weight of acrylonitrile, methacrylonitrile, or a mixture thereof;

(b) 0.1 to 10.0% by weight of a compound having 2 or more polymerizable olefinic double bonds; and

(c) 40.0 to 98.9% by weight of other copolymerizable compounds; and admixed to the composition

(d) up to 5% by weight cellulose ester, with the total amount of the components (a), (b), (c), and (d) being 100% by weight.

10. In a process for the production of an article having a substrate and a two-layer metal-effect coating adhered thereto comprising applying to said substrate a first coating composition containing metal pigments and a second clear coating composition over said first coating composition and stoving to produce said article, the improvement comprising said first coating composition prepared by copolymerizing:

(a) 1.0 to 50.0% by weight of acrylonitrile, methacrylonitrile, or a mixture thereof;

(b) 0.1 to 10.0% by weight of a compound having 2 or more polymerizable olefinic double bonds; and

(c) 40.0 to 98.9% by weight of other copolymerizable compounds; and admixed to the composition

(d) up to 5% by weight cellulose ester; with the total amount of the components (a), (b), (c), and (d) being 100% by weight;

and dispersing a polymer resin thus obtained together with metal pigments and organic solvents.

21. In a coating composition containing as the film-forming binder a polymer resin which was obtained by copolymerizing olefinically unsaturated compounds, for the base layer on a substrate of a two-layer metal-effect coating which has a clear top coating as the top finish, wherein said polymer resin is a copolymerization product of:

(a) 1.0 to 50.0% by weight of acrylonitrile, methacrylonitrile, or a mixture thereof;

(b) 0.1 to 10.0% by weight of a compound having 2 or more polymerizable olefinic double bonds; and

(c) 40.0 to 98.9% by weight of other copolymerizable compounds; and admixed to the composition

(d) up to 5% by weight cellulose ester;

with the total amount of the components (a), (b), (c), and (d) being 100% by weight.

4,413,037

ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE STYRENE HYDROXYETHYL (METH)ACRYLATE COPOLYMERS

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 274,590, Jun. 17, 1981, Pat. No. 4,360,641. This application Sep. 29, 1982, Ser. No. 426,530

Int. Cl.³ B32B *15/08*

U.S. Cl. 428—461 **7 Claims**

1. A coating composition comprising:

(A) a graft copolymer of an acrylic monomer or monomers or of acrylic monomer or monomers and other monomers copolymerizable therewith, on a backbone comprising a random copolymer of a styrene and between about 20 weight percent and about 30 weight percent of the random copolymer of hydroxyethyl (meth)acrylate, in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both, said graft copolymer being neutralized with ammonia, ammonium hydroxide, or a tertiary amine; and

(B) a cross-linking agent;

said composition being diluted with water to a solids content of between about 10 weight percent and about 40 weight percent.

4,413,038

ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE POLYSTYRENE

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 274,589, Jun. 17, 1981, Pat. No. 4,366,293. This application Sep. 29, 1982, Ser. No. 426,533

Int. Cl.³ B32B *15/08*

U.S. Cl. 428—461 **8 Claims**

1. A coating composition comprising:

(A) a graft copolymer of an acrylic monomer or monomers or of acrylic monomer or monomers and other monomers copolymerizable therewith and a polystyrene in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both, said graft copolymer being neutralized with ammonia, ammonium hydroxide, or a tertiary amine; and

(B) a cross-linking agent;

said composition being diluted with water to a solids content of between about 10 weight percent and about 40 weight percent.

4,413,039

STEEL SHEET PLATED WITH LAYERS OF NISN AND PB-SN ALLOY FOR AUTOMOTIVE FUEL TANK

Seizun Higuchi; Minoru Kamada, both of Kitakyushu; Kazuhiro Tano, Nakama; Tetsuo Fushino, Kitakyushu, and Minoru Fujinaga, Fukuoka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 20, 1981, Ser. No. 245,973

Claims priority, application Japan, Mar. 22, 1980, 55-35762; Aug. 8, 1980, 55-108362; Aug. 25, 1980, 55-115967

Int. Cl.³ B32B *15/01, 15/18*

U.S. Cl. 428—643 4 Claims

1. A steel sheet plated with an Pb-Sn alloy for automobile fuel tanks comprising:

a steel sheet as a base material;

a first layer of a Ni-Sn alloy consisting only of stoichiometric NiSn phase, said NiSn phase alloy being formed on the surface of said steel sheet base material and optionally a Ni backing layer, the total of both said Ni-Sn layer and said Ni backing layer, when present, being 0.035 to 1 microns in thickness; and,

a second layer of a plated Pb-Sn alloy formed on said NiSn phase alloy layer.

3. A steel sheet plated with an Pb-Sn alloy for automobile fuel tanks adapted to contain a fuel having an alcohol content, said steel sheet comprising:

a steel sheet as the base material;

a first layer of a Ni-Sn alloy consisting only of stoichiometric NiSn phase, said NiSn phase alloy being formed on the surface of said steel sheet and optionally a Ni backing layer, the total of both said Ni-Sn layer and said Ni backing layer, when present being 0.035 to 1 microns in thickness; and

a second layer of a plated Pb-Sn alloy formed on said NiSn alloy layer.

4,413,040

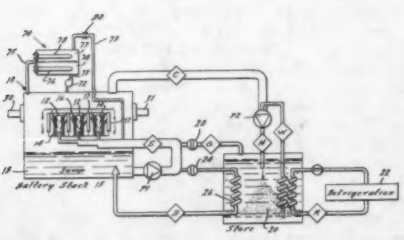
HYDROGEN/HALOGEN REACTOR SYSTEM FOR METAL HALOGEN BATTERIES

Peter Carr, Utica, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Apr. 26, 1982, Ser. No. 372,089

Int. Cl.³ H01M *8/18*

U.S. Cl. 429—19 7 Claims



1. In a metal halogen battery construction, the improved combination of,

at least one cell having a positive electrode and a negative electrode, separated by aqueous electrolyte containing the material of said metal and halogen,

sump means wherein the electrolyte is collected,

store means wherein halogen hydrate is formed and stored as part of an aqueous material,

means for circulating electrolyte through the cell,

conduit means for transmitting halogen gas formed in the cell to hydrate forming means associated with the store means,

a reactor means associated with said construction whereby halogen gas formed in the cell can be reacted to form hydrogen halide by controlled chemical reaction,

said reactor means including at least two reaction zones operative to prevent self-propagation of the reaction into other areas of the battery construction,

the first reaction zone being comprised of a reaction initiator means submersed in an aqueous medium to which hydrogen/halogen gas mixtures from the cell are introduced and reacted to form hydrogen halide,

the second reaction zone being comprised of a chamber means in communication with the first zone, and with said chamber also including a reaction initiator means to cause the reaction of any remaining hydrogen and halogen, and

means for returning the hydrogen halide formed in the reactor means for re-dispersion in the aqueous electrolyte.

4,413,041

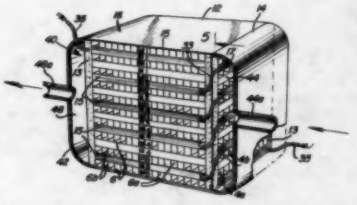
CROSS-FLOW MONOLITH REACTOR

Louis Hegedus, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,145

Int. Cl.³ H01M *8/12*

U.S. Cl. 429—33 22 Claims



1. A one piece integral reactor, adapted for use in a fuel cell, comprising a plurality of stacked essentially planar parallel sheets of a fluid-impermeable solid electrolyte capable of transporting oxygen ions, each sheet possessing a plurality of parallel elongated channels separated by ribs, said sheets divided into first and second groups wherein the sheets of said groups are interposed in an alternate manner, the channels of said first group forming an angle with the channels of said second group, the channels of said first group having a catalytic, oxygen-dissociating material disposed therein and the channels of the second group having a catalyst for promoting oxidation reactions disposed therein.

4,413,042

INERT GAS REJECTION SYSTEM FOR METAL HALOGEN BATTERIES

Peter Carr, Utica, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Apr. 26, 1982, Ser. No. 372,088

Int. Cl.³ H01M *2/38*

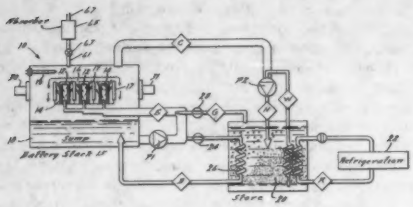
U.S. Cl. 429—51 5 Claims

1. A method of removing inert gases from a metal halogen electrolyte battery system in which hydrogen is generated along with other inerts, such as carbon dioxide, carbon monoxide, oxygen, or the like, said battery including a stack, sump, and electrolyte store, said method comprising,

circulating electrolyte over the battery stack with the stack being at least partially charged while preventing halogen replenishment to the battery stack from the battery store,

thereby generating hydrogen from the metal electrode to cause a positive pressure above ambient in the gas space associated with the battery sump,

subsequently removing the hydrogen and other inert gases from the system by venting the gases through an absorber



means which removes trace quantities of chlorine from the gases.

4,413,043

ELECTROCHEMICAL STORAGE CELL

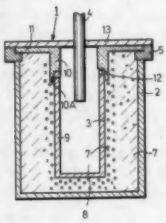
Günther Steinleitner, Schriesheim, and Wilhelm Haar, Sandhausen, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Kafertal, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 293,886

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033130

Int. Cl.³ H01M *4/36, 4/48, 6/20*

U.S. Cl. 429—104 **10 Claims**



1. Electrochemical storage cell or battery of the alkali metal and chalcogen type with at least one anode space for the alkali metal anolyte and a cathode space for the chalcogen catholyte, with the cathode space and the anode space separated from each other by an alkali ion-conducting solid electrolyte in the form of a cup-shaped solid electrolyte connected at its top open end to an annular insulating body, the combination therewith wherein the annular insulating body containing alpha-aluminum oxide is fastened by means of a joining material to the open end of the cup-shaped solid electrolyte of beta-aluminum oxide, said joining material containing a mixture of a glass powder and a ceramic powder, said glass powder contained in the joining material having a composition of about 50% by weight B_2O_3, about 40% by weight of BaO, and about 10% by weight of Al_2O_3, said ceramic powder is an alpha-aluminum oxide powder, said joining material applied as a suspension in glycerin, said glycerin being expelled from the suspension after said suspension is applied.

4,413,044

ELECTROPHOTOGRAPHIC COPYING PROCESS

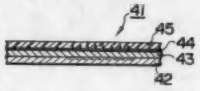
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,412

Claims priority, application Japan, Dec. 23, 1980, 55-182321

Int. Cl.³ G03G *13/22*

U.S. Cl. 430—53 **7 Claims**



1. An electrophotographic copying process utilizing a photosensitive member which includes a conductive layer carrying a sequential lamination of a photoconductive layer which is sensitive to visible light and a function layer different therefrom, forming an electrostatic latent image by trapping charge on opposite sides of either the photoconductive layer or the function layer in such a condition that the layer which is not retaining the charge is a photoconductive layer forming the photosensitive member, the function layer being formed of a layer taken from the group of layers consisting of a photoconductive layer and an electrically insulating layer, and repeatedly employing a copying step for developing the electrostatic latent image and transferring the toner deposited on said latent image to produce a plurality of copies, characterized in that the photosensitive member is subjected to at least one uniform exposure by radiation which activates that photoconductive layer forming the photosensitive member which is not retaining the charge during at least one of the copying steps for producing a plurality of copies of substantially uniform quality.

5. An electrophotographic copying process according to claim 1 in which the photosensitive member has a screen-shaped configuration.

4,413,045

MULTILAYER ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER COMPRISES DISAZO CHARGE GENERATOR LAYER, HYDRAZONE TRANSPORT LAYER

Shozo Ishikawa, Sayama; Kazuharu Katagiri, Mitaka; Katsunori Watanabe, Yamato; Kiyoshi Sakai, Mitaka, and Makoto Kitahara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,450

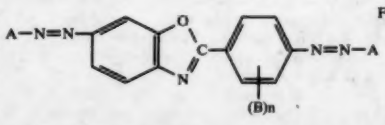
Claims priority, application Japan, May 26, 1981, 56-80620

Int. Cl.³ G03G *5/14*

U.S. Cl. 430—59 **7 Claims**

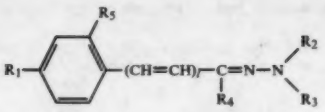
1. An electrophotographic photosensitive member characterized by comprising a charge generation layer containing at least one disazo pigment represented by the following formula [I] and a charge transport layer containing at least one hydrazone compound represented by the following formula [II]:

Formula [I]



wherein A is a coupler residue, B represents hydrogen, halogen, alkyl, or alkoxy, and n is an integer of 1 to 4;

Formula [II]



wherein R_1 represents N,N-dialkylamino, or N,N-diarylamino, or N-alkyl-N-arylamino, or alkoxy or aryloxy, each being substituted or unsubstituted; R_2 and R_3 each represent alkyl, aralkyl, or aryl, each being substituted or unsubstituted, or R_2 and R_3, together with the nitrogen atom which links them, represent nitrogen-containing heterocyclic ring; R_4 represents hydrogen, or alkyl, aralkyl, or aryl, each being substituted or unsubstituted; R_5 represents hydrogen, alkyl, or alkoxy; and l is 0 or 1.

4,413,046

DISAZO PHOTOCONDUCTOR WITH NITROPHTHALIC ANHYDRIDE SENSITIZER

Toru Nakazawa, Kumatori, and Akira Fushida, Suita, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 2, 1982, Ser. No. 365,050
Claims priority, application Japan, Apr. 6, 1981, 56/52208
Int. Cl.³ G03G *5/06, 5/09*
U.S. Cl. 430—83 **5 Claims**

1. A photosensitive composition for electrophotography, which consists essentially of (A) Dian Blue (C.I. 21180) or a nucleus halogen substituted derivative thereof as a photoconductor (B) 4-nitrophthalic anhydride as a sensitizer, and (C) an electrically insulating, electrophotographically inactive resin binder having a volume resistivity of at least 1×10^{14} Ω-cm, the sensitizer (B) being present in an amount of 1 to 200 parts by weight per 100 parts by weight of the photoconductor (A) and the binder (C) being present at a weight ratio of from 1/20 to 1/1.

4,413,047

CADMIUM PHOTOCONDUCTOR WITH (DIALKYLPYROPHOSPHATO) ORGANIC TITANATE ADDITIVE

Yoshiaki Kato, Hirakata; Akira Fushida, Suita; Hideo Fukuda, Katano; Toru Nakazawa, Osaka; Yasushi Kamezaki, Sakai, and Hideyuki Sasaki, Morioka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 12, 1982, Ser. No. 367,252
Int. Cl.³ G03G *5/087, 5/09*
U.S. Cl. 430—94 **11 Claims**

1. A photosensitive material for electrophotography comprising a conductive substrate and a layer of a composition comprising a dispersion of a cadmium sulfide containing photoconductive pigment in a binder resin, which is formed on the conductive substrate, wherein 0.05 to 5 parts by weight per 100 parts by weight of the photoconductive pigment of a (dialkylpyrophosphato) organic titanate is incorporated into said composition.

4,413,048

DEVELOPING COMPOSITION FOR A LATENT ELECTROSTATIC IMAGE FOR TRANSFER OF THE DEVELOPED IMAGE ACROSS A GAP TO A CARRIER SHEET

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Sep. 1, 1981, Ser. No. 298,351
Int. Cl.³ G03G *9/16*
U.S. Cl. 430—115 **13 Claims**

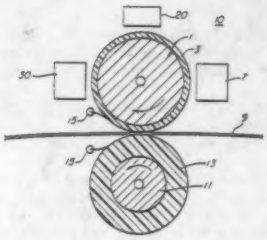
1. A composition for developing latent electrostatic images including in combination a major portion of a normally fluid insulating liquid, a minor portion of charged resinous toner particles, and a minor portion of nonconductive spacer particles, each of said spacer particles having a portion enclosing a gas bubble, and each of said spacer particles having a diameter larger than the diameter of said toner particles.

4,413,049

ANODIZED ELECTROSTATIC IMAGING SURFACE

Leo A. Beaudet, Milford, and Donald J. Lennon, Acton, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 164,482, Jun. 30, 1980, which is a continuation-in-part of Ser. No. 155,354, Jun. 2, 1980. This application Feb. 5, 1982, Ser. No. 346,349
Int. Cl.³ G03G *13/22*
U.S. Cl. 430—126 **17 Claims**



1. An electrostatic imaging method comprising the steps of:
(a) forming a latent electrostatic image on a dielectric image member, said image member being produced by:
hardcoat anodizing an aluminum member to form an oxide surface layer having a plurality of pores,
dehydrating the oxide surface layer to thoroughly remove water from the pores,
impregnating the dehydrated surface layer with a material selected from the group consisting of compounds of Group II or Group III metals with fatty acids, while maintaining the member in a moisture-free state, and
removing excess material from the member's surface;
(b) toning the latent electrostatic image;
(c) transferring the toned image to an image receptor solely by means of pressure exerted at the site of transfer.

4,413,050

PHOTOGRAPHIC PROCESS OF PRODUCING PHOTOGRAPHIC PRINTS UPON INSTANT PRINT FILM

W. Gregory Erf, 74 Cobbs Hill Dr., Rochester, N.Y. 14610

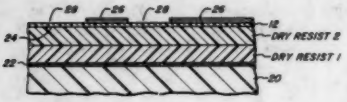
Continuation of Ser. No. 164,671, Jun. 30, 1980, abandoned. This application May 7, 1981, Ser. No. 261,462
Int. Cl.³ G03C *1/16*
U.S. Cl. 430—203 **17 Claims**

1. A process for making photographic color prints from a color positive transparency film of an object comprising, sequentially:
a. over-exposing the color positive transparency film in a camera while focused upon the object to produce a latent image upon the film;
b. developing the latent image upon the film, by immersion in developing materials sequentially, with immersion time in the first developer material reduced from effective normal to produce a low constrast actual image on the film;
c. projecting and exposing the actual image which is on the transparency film onto an instant print film according to the prescribed normal effective exposure procedures, times and temperatures; and
d. developing the instant print film according to the normal prescribed procedure.

4,413,051
METHOD FOR PROVIDING HIGH RESOLUTION, HIGHLY DEFINED, THICK FILM PATTERNS

Lowell E. Thomas, Tewksbury, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed May 4, 1981, Ser. No. 260,266
Int. Cl.³ G03C 5/00; B05D 5/12; C25D 5/02; C23F 1/02
U.S. Cl. 430—312 20 Claims



1. A method of patterning conductive films having a thick film conductivity with resolution and line uniformity comparable to that obtainable with thin film techniques, comprising the steps of:

laminating a number of layers of dry film photo resist to a substrate without a baking step;

selectively exposing the laminated resist in a single exposure step;

developing the resist in a single step by applying a pressurized mist to the top surface of the exposed laminated resist, thereby to expose selected portions of the substrate; and,

depositing material at the exposed portions of the substrate to a level established by the laminated layers.

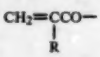
4,413,052
PHOTOPOLYMERIZATION PROCESS EMPLOYING COMPOUNDS CONTAINING ACRYLOYL GROUP AND ANTHRYL GROUP

George E. Green, Stapleford, England; Ewald Losert, Rheinfelden, Switzerland, and John G. Paul, Falkirk, Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

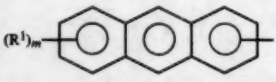
Filed Mar. 25, 1982, Ser. No. 361,701
Claims priority, application United Kingdom, Feb. 4, 1981, 8110403
Int. Cl.³ G03C 5/00
U.S. Cl. 430—327 16 Claims

1. A process for production of an image which comprises

(1) exposing to actinic radiation a layer, supported on a carrier, of a liquid composition containing a photoinitiator and a compound (A) having in the same molecule both at least one group of formula


III

and at least one group of formula


IV

where

R denotes a hydrogen atom or a methyl group,

R^1 denotes a chlorine or bromine atom, a methyl group, or a nitro group, and

m is zero, 1, or 2,

such that the layer solidifies and becomes essentially non-tacky due to photopolymerisation of (A) through the group or groups of formula III but remains substantially photocrosslinkable, and subsequently,

(2) exposing the layer so solidified through an image-bearing transparency consisting of substantially opaque and substantially transparent parts to a substantially greater amount of actinic radiation such that the further exposed part or parts of the photopolymerised layer undergo photocrosslinking through the group or groups of formula IV, and

(3) developing the image by dissolving in a solvent the part or parts of the layer which have not become photocrosslinked.

4,413,053
RADIOGRAPHIC ELEMENTS EXHIBITING REDUCED CROSSOVER

Thomas I. Abbott, Rochester, and Cynthia G. Jones, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,910
Int. Cl.³ G03C 1/76
U.S. Cl. 430—502 15 Claims

1. In a radiographic element comprised of

first and second imaging means,

at least said first imaging means including a silver halide emulsion comprised of a dispersing medium and radiation-sensitive silver halide grains, and

a support interposed between said imaging means capable of transmitting radiation to which said second imaging means is responsive

the improvement comprising said first imaging means containing

tabular silver halide grains having a thickness of less than 0.2 micron and an average aspect ratio of from 5:1 to 8:1 accounting for at least 50 percent of the total projected area of said silver halide grains present in said silver halide emulsion and

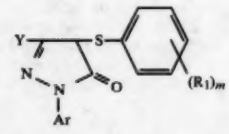
spectral sensitizing dye adsorbed to the surface of said tabular silver halide grains in an amount sufficient to substantially optimally sensitize said tabular grains.

4,413,054
SILVER HALIDE COLOR PHOTOSENSITIVE MATERIALS

Akio Mitsui, and Kotaro Nakamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1982, Ser. No. 363,736
Claims priority, application Japan, Jul. 7, 1981, 56-105837
Int. Cl.³ G03C 1/40
U.S. Cl. 430—555 8 Claims

1. A silver halide color photosensitive material containing a 4-arylthio-5-pyrazolone coupler represented by Formula (I)


(I)

wherein Ar represents a phenyl group substituted with one or more substituents selected from halogen atoms, alkyl groups, alkoxy groups, alkoxycarbonyl groups, or cyano groups, R_1 represents hydrogen, a halogen atom, an acylamino group, a sulfonamido group, a carbomoyl group, a sulfamoyl group, an alkylthio group, an alkoxycarbonyl group, a hydroxyl group, an alkyl group, an alkoxy group, or an aryl group, m represents an integer of from 1 to 5 and R_1 may be same or different when m is 2 or more, and Y represents an acylamino group or an anilino group and said silver halide coupler photosensitive material comprising a layer containing an emulsion of light-insensitive fine silver halide particles having an average particle diameter from 0.01 to 0.20μ.

4,413,055

SILVER HALIDE EMULSION, A PHOTOGRAPHIC MATERIAL AND A PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES

Edith Weyde, Kuerten; Harald von Rintelen, Leverkusen; Wilhelm Saleck, Bergisch Gladbach, and Heinz-Horst Teitscheid, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,143

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037383

Int. Cl.³ G03C 5/26, 1/02

U.S. Cl. 430—567 9 Claims

1. A photosensitive material for the production of vesicles in imagewise distribution containing at least one silver halide emulsion layer comprising as silver halide essentially silver bromide and having a silver content (expressed as silver nitrate) of 1 to 800 mg, and optionally further layers, wherein the silver halide grains of the silver halide emulsion have an average grain size of utmost 0.1 μm and wherein the grains of the emulsion have been precipitated in the presence of at least one Co^{2+}, Ce^{3+}, Ce^{4+}, Cu^{+}, or Cu^{2+} salt said salt being in a quantity of from 10^{-1} to 10^{-8} moles per mole of silver halide.

4,413,056

PROCESS FOR THE PREPARATION OF PENICILLINS AND PENICILLIN DERIVATIVES

Ian R. Chester, Littlehampton; Lawson W. Powell, Worthing, and David G. Roberts, Storrington, all of England, assignors to Beecham Group Limited, England

Filed Oct. 19, 1981, Ser. No. 312,667

Claims priority, application United Kingdom, Nov. 5, 1980, 8035454

Int. Cl.³ C12P 37/00

U.S. Cl. 435—43 14 Claims

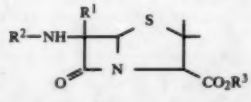
1. A process for the preparation of a compound of formula (I):

(I)

wherein

R^1 is hydrogen, hydroxy, mercapto radical, a substituted or unsubstituted methoxy, ethoxy, methyl, ethyl, methyl thio, or ethylthio radical, a carbamoyloxy, carbamoylthio, C_{1-6} alkanoyloxy, C_{1-6} alkanoylthio, cyano, carboxy or carbamoyl radical; and

R^2 represents an acyl group which comprises hydrolysis of a compound of formula (II):



(II)

wherein R^1 and R^2 are as defined with respect to formula (I) hereinbefore and R^3 represents benzyl or substituted benzyl; characterised in that the hydrolysis is catalysed by a microbial serine proteinase.

4,413,057

GROUP B STREPTOCOCCAL CAPSULAR POLYSACCHARIDES

Dennis J. Carlo, Bound Brook; Karl H. Nollstadt, Clark; Thomas H. Stoudt, Westfield, and Robert Z. Maigetter, Summit, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 140,031, Apr. 14, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 343,305

Int. Cl.³ C12P 19/04; C08B 37/00; A61K 39/02

U.S. Cl. 435—101 8 Claims

1. A process for the preparation of an antigenic type-specific polysaccharide of Group B Streptococcus comprising

(a) growing the Group B Streptococcus bacteria types I_a, I_b, II, or III in a high glucose, soy bean and yeast extract fermentation medium;

(b) separating the cell paste from the liquid medium;

(c) treating the liquid medium from step (b) with a strong ionic salt and a water-miscible lower alkanol to precipitate impurities or alternatively digesting the cell paste with an enzyme to obtain a liquid extract;

(d) precipitating the crude polysaccharide from the treated liquid medium, or if desired, the liquid extract from digested cell paste with a sufficient amount of water-miscible lower alkanol;

(e) suspending the crude polysaccharide of step (d) in deionized water and adding thereto sufficient cationic detergent to precipitate the polysaccharide;

(f) redissolving the polysaccharide in 15% (wt/wt) sodium acetate aqueous solution; and

(g) precipitating the semi-purified polysaccharide from the solution with alcohol and, optionally, digesting the resulting precipitate with a proteolytic enzyme, followed by precipitating the enzyme-treated polysaccharide with a sufficient amount of water-miscible alkanol.

4,413,058

CONTINUOUS PRODUCTION OF ETHANOL BY USE OF FLOCCULENT *ZYMOMONAS MOBILIS*

Edward J. Arcuri, Del Mar, Calif., and Terrence L. Donaldson, Lenoir City, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jan. 28, 1982, Ser. No. 343,610

Int. Cl.³ C12P 7/06

U.S. Cl. 435—161 4 Claims

1. A method for producing ethanol, comprising:

placing flocculent *Zymomonas mobilis* "f" NRRL B-12526 in a reactor column; and

passing a stream containing water, sugar, and yeast extract through said reactor column at a flow rate which permits conversion of sugar in said stream to ethanol in said column and retention of said flocculent *Zymomonas mobilis* "f" NRRL B-12526 in said reactor column.

4,413,059

APPARATUS FOR PREPARING SINGLE CELL SUSPENSION

Claude Tihon, Manlius, and M. Elaine Curry, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 188,710, Sep. 19, 1980, Pat. No. 4,350,768. This application Feb. 1, 1982, Ser. No. 344,498

Int. Cl.³ C12M 3/02, 1/16; B02C 1/00; B02D 33/00

U.S. Cl. 435—286 7 Claims

1. An apparatus for preparing a suspension of single tissue cells comprising the combination of

confining means for confining a quantity of a liquid suspension of animal tissue;

a screen;

means supporting the screen;

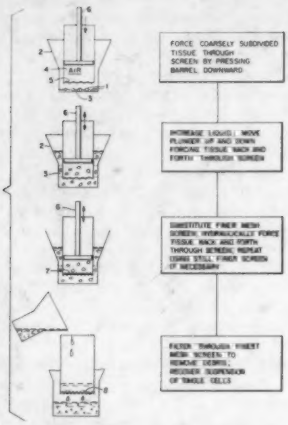
pump means for passing the liquid suspension of tissue from the confining means back and forth through the screen; the pump and the confining means comprising at least two

telescopically-related members defining an expansible and contractible chamber having an open end;

the screen being detachably secured across the open end of the chamber;

relative movement of the telescopically-related members in one direction causing the chamber to expand and relative movement of said telescopically-related members in the other direction causing the chamber to contract;

at least one of the telescopically-related members being free to be moved to cause expansion and contraction; and


FORCE COARSELY SUBDIVIDED TISSUE THROUGH SCREEN BY PRESSING BARREL DOWNWARD
INCREASE LIQUID MOVE PLUNGER UP AND DOWN FORCING TISSUE BACK AND FORTH THROUGH SCREEN
SUBSTITUTE FINER MESH SCREEN, HYDRAULICALLY FORCE TISSUE BACK AND FORTH THROUGH SCREEN, REPEAT TISSUE STILL FINER SCREEN IF NECESSARY
FILTER THROUGH FINEST MESH SCREEN TO REMOVE DEBRIS, RECOVER SUSPENSION OF SINGLE CELLS

the confining means being constructed and arranged to confine a quantity of the liquid suspension of tissue with the screen in contact therewith whereby relative movement of the telescopically-related members in a direction to expand the chamber will cause the suspension to flow through the screen in one direction and relative movement of the telescopic members in a direction to contract the chamber will cause the suspension to flow through the screen in the opposite direction.

4,413,060

PROCESS AND APPARATUS FOR DISTRIBUTION AND PREPARATION OF SAMPLES FROM PRIMARY VESSELS

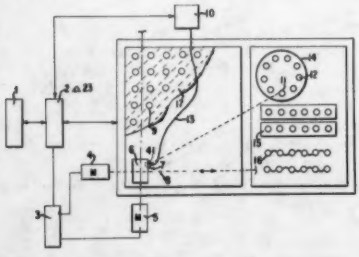
Gerd Assmann, and Horst-Dietrich Helb, both of Münster, Fed. Rep. of Germany, assignors to Boehringer Ingelheim Zentrale GmbH, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,929

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035340

Int. Cl.³ G01N *35/00, 35/06*

U.S. Cl. 436—47 **3 Claims**



1. A method of sampling and distributing a liquid material which comprises drawing a liquid sample from a source thereof and placing it in a primary vessel, sealing said sample in the primary vessel with a sealing means which has one or more passages through which a positive pressure or a partial vacuum may be applied to the interior of the primary vessel and a relatively narrow dispensing passage from the interior of the primary vessel to the outside thereof, inverting the primary vessel containing the liquid therein by the combination of the sealing means, the walls of the vessel, the narrowness of the passage to the outside and by the equal or slightly negative pressure within the primary vessel with respect to the ambient pressure; moving the inverted primary vessel in a predetermined sequence to positions over secondary receiving vessels, increasing the pressure above the liquid in the primary vessel sufficiently to expel a predetermined amount of said liquid into a secondary vessel, reducing the pressure to equilibrium or to a slight vacuum, moving the primary vessel to successive positions and repeating the steps, recording data to relate the source of the sample in the primary vessel to the portions thereof dispensed into the secondary vessels and upon completing the desired providing of samples to various secondary vessels returning the primary vessel to its starting point.

4,413,061

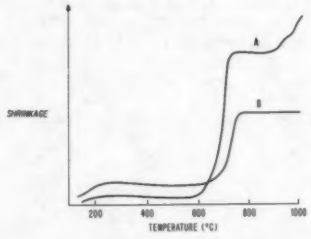
GLASS-CERAMIC STRUCTURES AND SINTERED MULTILAYER SUBSTRATES THEREOF WITH CIRCUIT PATTERNS OF GOLD, SILVER OR COPPER

Ananda H. Kumar, Wappingers Falls, N.Y.; Peter W. McMillan, Warwick, England, and Rao R. Tummala, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 875,703, Feb. 6, 1978, Pat. No. 4,301,324. This application Jun. 22, 1981, Ser. No. 276,236

Int. Cl.³ C03C *3/22*; H05K *3/34*

U.S. Cl. 501—7 **20 Claims**



1. A non-porous sintered glass ceramic article comprising:

a microstructure of a pervasive continuous network of 2 to 5 μm crystallite selected from the group consisting of β-spodumene and alphacordierite with the interstices of said β-spodumene network occupied by residual glass having dispersed therein discrete secondary 1 to 2 μm crystallites of lithium metasilicate and the interstices of said alphacordierite network occupied by residual glass having dispersed therein 1 to 2 μm crystallites of clinoenstatite.

2. A method of making a glass ceramic article comprising forming a glass from a batch containing, by weight

65 to 75%	SiO_2	3.5 to 11%	LiO_2
12 to 17%	Al_2O_3	0 to 2.5%	B_2O_3
0 to 2%	MgO	0 to 2.5%	P_2O_5
0 to 2%	ZnO_2	0 to 3%	F

and including from 0 to 2% of at least one oxide selected from the group consisting of CaO and BaO, and from 1.0

to 3.5% of at least one oxide selected from the group consisting of Na_2O and K_2O;
pulverizing said glass to particle sizes of about 2 to about 7 μm;
shaping said glass particles into a desired configuration;
heating said shaped particles to a temperature in the range of about 870° to about 1000° C. at a rate not exceeding 2° C./minute;
sintering said shaped particles at said temperature for times in the range of 1 to 5 hours to coalesce and crystallize said particles; and
cooling said sintered particles at a rate not exceeding 4° C. per minute to a temperature of at least about 400° C.

4,413,062

MOLDING COMPOSITION AND PRODUCT PRODUCED THEREFROM

Irvin C. Huseby; Jan W. Szymaszek, both of Schenectady, N.Y., and Eldon B. Heft, West Hartford, Conn., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 284,867, Jul. 20, 1981, abandoned. This application May 27, 1982, Ser. No. 382,848

Int. Cl.³ C04B *35/16*

U.S. Cl. 501—123 **10 Claims**

1. A process of producing a polycrystalline ceramic which comprises calcining wollastonite powder to produce a calcined powder at least significantly free of calcite, forming a mixture comprised of from about 15% by weight to about 30% by weight of phosphoric acid and from about 70% by weight to about 85% by weight of said calcined wollastonite, said phosphoric acid ranging in concentration of P_2O_5 from about 61% by weight to about 76% by weight of the total weight of said acid, die-pressing the resulting mixture to impart at least sufficient green strength to the pressed piece to allow its removal from the press, and firing the pressed piece in air at or about atmospheric pressure at a firing temperature ranging from about 500° C. to about 900° C.

4,413,063

PROCESS FOR OPERATING HIGHLY EXOTHERMIC REACTIONS

Francois Audibert, Ecully; Andre Sugier, Rueil Malmaison, and Hugo Van Landeghem, Oytier Saint Oblas, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 25, 1981, Ser. No. 324,758

Claims priority, application France, Nov. 25, 1980, 80 25031

Int. Cl.³ C07C *1/04, 27/06*

U.S. Cl. 518—700 **11 Claims**

1. In a process for synthesizing hydrocarbons or alcohols, comprising reacting carbon monoxide with hydrogen, in the presence of a catalyst for synthesis of hydrocarbons or alcohols, and in the presence of an inert diluent,
the improvement comprising downwardly flowing the carbon monoxide and hydrogen, as a gas phase, in admixture with a liquid phase of said inert diluent, through a reaction zone comprising a fixed bed of said catalyst, the superficial velocities of the gas phase and of the liquid phase each being at least 1.5 centimeters per second under the temperature and pressure conditions of the reaction.

4,413,064

FLUID BED CATALYST FOR SYNTHESIS GAS CONVERSION AND UTILIZATION THEREOF FOR PREPARATION OF DIESEL FUEL

Harold Beuther, Cheswick; Charles L. Kibby, Gibsonia; T. P. Kobylinski, Prospect, and Richard B. Pannell, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 13, 1981, Ser. No. 310,977

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—715 **17 Claims**

1. A process for the conversion of synthesis gas to a product high in straight chain paraffins in the diesel fuel boiling range, which comprises contacting said synthesis gas under conversion conditions with a catalyst consisting essentially of cobalt, thoria or lanthana and ruthenium on an alumina support wherein said alumina is gamma-alumina, eta-alumina or a mixture thereof, said catalyst prepared by contacting finely divided alumina with
(A) an aqueous impregnation solution of a cobalt salt, and
(B) a nonaqueous, organic impregnation solution of a ruthenium salt and a salt of thorium or lanthanum.

4,413,065

PROCESS FOR MAKING LOW DENSITY CHLORINATED POLYVINYL CHLORIDE FOAM

Dale R. Hall, Avon Lake, and Charles N. Bush, Bay Village, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 425,838, Sep. 28, 1982, Pat. No. 4,383,048. This application Feb. 9, 1983, Ser. No. 465,130

Int. Cl.³ C08J *9/06, 9/14*

U.S. Cl. 521—82 **7 Claims**

1. A low density foam product comprising expanded chlorinated polyvinyl chloride polymer said polymer having a chlorine content of from 60% to 73% by weight having an essentially closed-cell cellular structure composed predominantly of cells having a cell size less than 500 microns, said cells containing a gas derived from a primary blowing agent and hydrogen gas derived from the activation of a nucleating system composed of an alkali metal borohydride and a proton donor activator compatible with said polymer selected from the group consisting of hydrated salts and organic acids, said foam having a density less than 20 lbs/ft³.

4,413,066

CROSSLINKABLE POLYETHYLENE RESIN COMPOSITIONS

Tsutomu Isaka; Mitsugu Ishioka; Takeo Shimada, and Takayuki Inoue, all of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company, Ltd., Japan

Division of Ser. No. 54,474, Jul. 3, 1979, abandoned. This application Feb. 18, 1981, Ser. No. 235,749

Claims priority, application Japan, Jul. 5, 1978, 53-80952; Jul. 5, 1978, 53-80953

Int. Cl.³ C08J *9/22*

U.S. Cl. 521—149 **14 Claims**

1. An expandable crosslinkable polyethylene resin composition comprising
a copolymer formed by the copolymerization of ethylene and vinyltrimethoxysilane, wherein the content of vinyltrimethoxysilane in said copolymer is about 0.01 to 5 percent by weight and wherein said copolymer has been prepared by copolymerization under elevated pressure in the presence of a radical polymerization initiator,
a silanol condensation catalyst and
a foaming agent in the amount of 0.2 to 30 percent by weight based on the total weight of the copolymer and foaming agent, wherein said resin composition is capable of forming an expanded and crosslinked product having a gel content of about 23% to 78%.

4,413,067
NOVEL HYDROGENATED RESIN PRODUCED FROM FIVE-MEMBER CYCLIC COMPOUNDS HAVING A CONJUGATED DOUBLE BOND AND/OR DIELS-ALDER ADDITION PRODUCTS THEREOF

Shozo Tsuchiya, Tokyo; Akio Oshima, and Hideo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Division of Ser. No. 177,536, Aug. 13, 1980, abandoned. This application May 17, 1982, Ser. No. 378,682

Claims priority, application Japan, Aug. 22, 1979, 54-106109; Aug. 23, 1979, 54-106606; Nov. 14, 1979, 54-146442; Jun. 6, 1980, 55-75453; Jun. 6, 1980, 55-75454

Int. Cl.[3] C08L *45/00*

U.S. Cl. 523—172 33 Claims

1. A resin composition comprising:

a hydrogenated resin obtained by hydrogenating a copolymer resin which has been produced by copolymerizing a five-member cyclic compound (component A) selected from the group consisting of cyclopentadiene, dicyclopentadiene, and mixtures thereof with a codimer (component B) of cyclopentadiene with 1,3-butadiene selected from the group consisting of tetrahydroindene, vinylnorbornene, and mixtures thereof, by copolymerizing a mixture of 20 to 90 parts by weight of said component A with 80 to 10 parts by weight of said component B; and one constitutent selected from the group consisting of ethylenic copolymers and/or waxes; pigments and/or fillers; block-copolymers represented by the general formula of $(A\text{-}B)_n$ or $(A\text{-}B)_{n-1}\text{-}A$, wherein A is a non-elastomeric polymer block having a glass transition point of higher than 20° C. and an average molecular weight ranging within 5,000 to 125,000, B is an elastomeric polymer block of a conjugated diene having an average molecular weight of 15,000 to 500,000, the polymer block A occupies less than 80 wt% of the block-copolymer and n is an integer of not less than 2; and natural and synthetic rubbers and mixtures thereof.

4,413,068
HARD SHELL SOFT CORE LATEX

Alvin R. Sinclair, and Edward H. Gleason, both of Beaver, Pa., assignors to Polysar International S.A., Fribourg, Switzerland

Filed Jul. 2, 1981, Ser. No. 279,951

Int. Cl.[3] C08L *9/08*

U.S. Cl. 523—201 5 Claims

1. A latex comprising about 40 to 60 weight percent of heterogeneous polymer particles which have

(a) an initial domain, comprising about 50% by volume of the particle which is a polymer of a monomer composition comprising:

(i) from about 55 to about 65 parts by weight of a monovinylidene aromatic monomer;

(ii) From about 45 to about 35 parts by weight of an aliphatic $C_{4\text{-}6}$ conjugated diene monomer; and per 100 parts by weight of the total of said monovinylidene aromatic monomer and said aliphatic $C_{4\text{-}6}$ conjugated diene monomer;

(iii) from about 0.5 to 5 parts by weight of $C_{3\text{-}6}$ ethylenically unsaturated carboxylic acid, anhydrides thereof, or a mixture thereof and

(iv) from about 0.5 to 5 parts by weight of a $C_{3\text{-}6}$ ethylenically unsaturated primary amide or a mixture thereof; and

(b) a subsequent domain comprising about 50% by volume of the particle which is a polymer of a monomer composition comprising:

(i) from about 75 to 85 parts by weight of a monovinylidene aromatic monomer;

(ii) from about 25 to 15 parts by weight of an aliphatic $C_{4\text{-}6}$ conjugated diene monomer and per 100 parts by weight of the total of said monovinylidene aromatic monomer and said aliphatic $C_{4\text{-}6}$ conjugated diene monomer;

(iii) from about 0.5 to 5 parts by weight of a $C_{3\text{-}6}$ ethylenically unsaturated carboxylic acid, anhydrides thereof, or a mixture thereof and;

(iv) from about 0.5 to 5 parts by weight of a $C_{3\text{-}6}$ ethylenically unsaturated primary amide or a mixture thereof;

4,413,069
COMPOSITION WITH SELECTIVELY ACTIVE MODIFIER AND METHOD

Joseph W. Marshall, 1617 Beverly Blvd., Los Angeles, Calif. 90026

Filed Sep. 20, 1982, Ser. No. 422,446

Int. Cl.[3] C09D *5/32, 7/14*

U.S. Cl. 523—205 24 Claims

1. Composition comprising a modifiable matrix and means selectively releasing aliquot portions of modifier distributively through said matrix, said means comprising microcapsules containing a matrix-modifying effective amount of said modifier portions out of matrix contact and a microwave electromagnetic-radiation responsive agent differentially heating-responsive to said radiation relative to the wall of said microcapsule, whereby said modifier is retained within said microcapsules in microwave electromagnetic radiation-responsive releasable relation and said matrix is modified by contact with said released modifier upon composition exposure to said radiation.

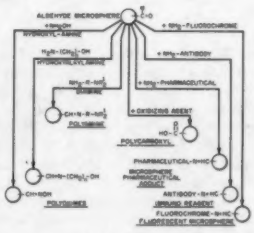
4,413,070
POLYACROLEIN MICROSPHERES

Alan Rembaum, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Mar. 30, 1981, Ser. No. 248,899

Int. Cl.[3] C08F *2/54, 16/34*

U.S. Cl. 523—223 16 Claims



1. A composition comprising an aqueous suspension of small, polymeric microspheres having a diameter from 500 Angstroms to 10 microns comprising the addition interpolymerizate of a monomer mixture consisting essentially of:

20% to 90% by weight of an unsaturated aldehyde selected from acrolein and C_1 to C_8 aryl, alkyl or cycloalkyl derivatives thereof;

10% to 50% by weight of at least one addition copolymerizable mono-unsaturated, freely water-soluble acrylic comonomer substituted with a hydrophilic substituent selected from amino, carboxyl or hydroxyl; and

0.1 to 20% by weight of an addition copolymerizable, polyunsaturated cross-linking agent.

4,413,071

PREPARATION OF AQUEOUS EPOXY RESIN DISPERSIONS, AND THEIR USE

Eckehardt Wistuba, Bad Durkheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 273,861

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025609

Int. Cl.[3] C08L *63/10*

U.S. Cl. 523—411 6 Claims

1. A process for the preparation of an aqueous epoxy resin dispersion containing from 40 to 75% by weight of water, wherein

(A) an epoxy resin having more than one 1,2-epoxide group per molecule is reacted with

(B) from 1 to 30% by weight, based on the epoxy resin (A), of a protective colloid which contains basic nitrogen and has an amine number of from 10 to 90, said protective colloid being a copolymer which contains, as copolymerized units, vinyl propionate and vinylpyrrolidone as well as vinylimidazole, vinylpyridine or dimethylaminoethyl acrylate or methacrylate, with or without up to 35% by weight of other copolymerizable ethylenically unsaturated compounds in the presence of

(C) from 50 to 1,000 mole percent, relative to the amount of basic nitrogen in the protective colloid (B), of an acid, and in the presence or absence of one or more organic solvents, at from 50° to 150° C., the reaction product is dispersed by adding water and any organic solvent present is then distilled off.

4,413,072

MIXTURES OF POLYURETHANES AND UNSATURATED POLYESTER RESINS

Bernhard Hess, Moers; Hansjochen Schulz-Walz, Krefeld; Hannes von Harpe, Krefeld; Bernd Peitzer, Krefeld, and Ludwig Bottenbruch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 81,072, Oct. 2, 1979, abandoned. This application Jun. 9, 1981, Ser. No. 272,068

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1978, 2843822

Int. Cl.[3] C08G *63/76;* C08L *67/06*

U.S. Cl. 523—500 1 Claim

1. A thickened resin mat comprising:

(I) 100 parts by weight of a resin mixture,

(II) 5–100 parts by weight of reinforcing fibers and

(III) 0.1–10 parts by weight of a chemical thickener selected from the group consisting of magnesium oxide, magnesium hydroxide, calcium oxide, and calcium hydroxide,

characterized in that the resin mixture I is a mixture of

(A) 20 to 70 parts by weight of at least one α,β-ethylenically unsaturated polyester containing at least three double bonds per molecule,

(B) 20 to 70 parts by weight of at least one vinyl or vinylidene compound copolymerizable with A, and

(C) 3 to 30 parts by weight of at least one polyurethane containing both ester moieties and at least 0.01 equivalents of urethane moiety per 100 g of the polyurethane and said polyurethane contains at least one terminal radically polymerizable double bond per molecule and sufficient carboxyl moieties corresponding to an acid number of at least 8 based on the polyurethane.

4,413,073

STABLE AQUEOUS FILM-FORMING DISPERSIONS

David V. Gibson, Armadale; Rodney W. Parr, Doncaster, and John E. Swalwell, Doncaster East, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Jun. 29, 1982, Ser. No. 393,405

Claims priority, application Australia, Jun. 29, 1981, PE9496; Dec. 23, 1981, PF2074

Int. Cl.[3] C08L *33/00, 33/12*

U.S. Cl. 523—511 14 Claims

1. A process of preparing an aqueous dispersion of film-forming polymer wherein pre-formed polymer, unsaturated monomer and water are mixed so as to form a dispersion of particles wherein the individual particles comprise a blend of pre-formed polymer and monomer and are stabilized by the presence of a stabilizing compound, and the monomer is polymerized to give an aqueous dispersion of particles wherein each particle comprises a blend of pre-formed polymer and polymer formed in situ from the monomer, characterized in that the stabilizing compound is an amphipathic compound with an H.L.B. value of at least 8, that portion of the compound which is lipophilic comprising at least one ethylenic double bond.

4,413,074

HYDROPHILIC SURFACES AND PROCESS FOR MAKING THE SAME

Wolfgang J. Wrasidlo, and Karol J. Mysels, both of La Jolla, Calif., assignors to Brunswick Corporation, Skokee, Ill.

Filed Jan. 25, 1982, Ser. No. 342,068

Int. Cl.[3] C08L *1/28;* C08F *253/00;* B05D *5/00*

U.S. Cl. 524—43 10 Claims

1. A process for treating a hydrophobic polymer surface so as to render said surface hydrophilic in character which comprises:

contacting said surface with a solution of a hydroxyalkyl cellulose and a perfluorocarbon surfactant in a solvent selected from the group consisting of water, and mixtures of water and water miscible aliphatic alcohols so as to provide a layer of said solution on said surface, said surfactant being present in said solution in an amount sufficient to cause said solution to wet substantially all of said surface, said cellulose being present in said solution in an amount effective to form a layer of said cellulose coating said surface upon the removal of solvent from said solution, and

heating said surface and said layer to a temperature sufficient to remove said solvent from said layer and to a temperature sufficient to cause sufficient insolubilization of said cellulose to hold said cellulose on said polymer surface in the presence of water.

4,413,075

PIPERIDINE POLYMERS AND USE THEREOF AS STABILIZERS

Piero Di Battista, S. Donato Milanese, Italy, assignor to Montedison S.p.A., Milan, Italy

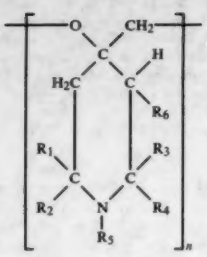
Filed Mar. 15, 1982, Ser. No. 358,487

Claims priority, application Italy, Mar. 16, 1981, 20354 A/81

Int. Cl.[3] C07D *401/12;* C08K *5/34*

U.S. Cl. 524—102 17 Claims

1. Substituted poly-oxy-methylene-piperidines having the general formula:



(I)

wherein:

R_1, R_2, R_3, R_4, either like or unlike one another, are each an alkyl radical containing 1 to 4 carbon atoms, or R_1 and R_2, and/or R_3 and R_4, together, form a cyclo-alkylene radical containing 3 to 12 carbon atoms;

R_5 is hydrogen, an alkyl, hydroxyalkyl or alkyl-oxy radical containing 1 to 6 carbon atoms; an aryl or arylalkyl radical containing 6 to 18 carbon atoms; an alkenyl radical containing 2 to 6 carbon atoms or a $-(CH_2)_XCO_2R_7$ radical in which X is zero or an integer from 1 to 12 and R_7 is H, a metal selected from the alkaline metals, the alkaline-earth metals, and the transition metals, an alkyl, alkylene, alkenyl, alkenylene radical, each containing 1 to 20 carbon atoms;

R_6 is hydrogen or an alkyl radical containing 1 to 4 carbon atoms, and

n is an integer from 2 to 100.

6. A composition comprising a thermoplastic synthetic polymer stabilized to light, to oxygen and to heat, and characterized in that it contains, in an amount sufficient to prevent degradation of the thermoplastic synthetic polymer, a substituted poly-oxy-methylene-piperidine having the general formula (I) according to claim **1**.

4,413,076

POLYALKYLPIPERDINE SIDE CHAIN STABILIZERS FOR SYNTHETIC POLYMER COMPOSITIONS

Nobuo Soma; Syoji Morimura; Takao Yoshioka, and Tomoyuki Kurumada, all of Hiromachi, Japan, assignors to Sankyo Company Ltd., Tokyo, Japan

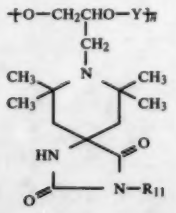
Continuation of Ser. No. 183,153, Sep. 2, 1980, abandoned, which is a continuation of Ser. No. 957,100, Nov. 3, 1978, abandoned. This application Aug. 30, 1982, Ser. No. 412,806

Claims priority, application Japan, Nov. 8, 1977, 52-133776

Int. Cl.³ C08K *5/16*

U.S. Cl. 524—102 **7 Claims**

1. A synthetic polymeric material composition containing from 0.01 to 5 percent by weight of a stabilizer to stabilize it against photo- and thermal-deterioration, the stabilizer comprising a polymer having the formula



wherein

Y represents a saturated aliphatic diacyl group having from 4 to 12 carbon atoms, a benzenedicarbonyl group, a cyclohexanedicarbonyl group, a 4-cyclohexene-1,2-dicarbonyl group, a 3-(or 4-)methyl-4-cyclohexene-1,2-dicarbonyl group or a 5-norbornene-2,3-dicarbonyl group,

R_{11} represents an alkyl group having from 1 to 12 carbon atoms, a group of formula $—CH_2CH_2OR_{18}$ (in which R_{18} represents an alkanoyl group having from 2 to 12 carbon atoms, a benzoyl group or a 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionyl group), and

n is an integer of from 2 to 50.

4,413,077

OLIGOMERIC AROMATIC POLYPHOSPHITES

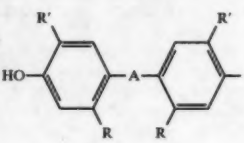
Leo L. Valdiserri, Belpre, Ohio, and Ingenuin Hechenbleikner, West Cornwall, Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

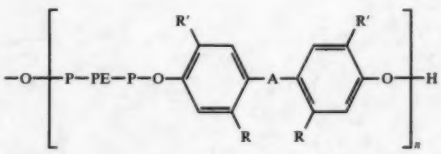
Filed Jun. 22, 1981, Ser. No. 275,575

Int. Cl.³ C07F *9/15*; C08K *5/52*

U.S. Cl. 524—120 **10 Claims**

1. An oligomeric, phenol-free, polyphosphite conforming to the structural formula:





where R is methyl or hydrogen R' is a tertiary alkyl, cycloalkyl or phenylalkyl group of 4–10 carbon atoms, A is alkylidene or sulfur, PE is a pentaerythritol residue and n is at least 2.

4. A polymer composition comprising a major proportion of a polymer normally subject to deterioration at elevated temperatures and a minor proportion effective to inhibit such deterioration of the composition of claim **1**.

4,413,078

LIGHT-STABLE POLYOLEFINS

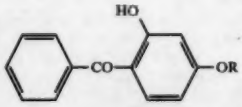
Elyse B. Lewis, Williamstown, W. Va., and Leo L. Valdiserri, Belpre, Ohio, assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed May 7, 1982, Ser. No. 375,946

Int. Cl.³ C08K *5/13, 5/52*

U.S. Cl. 524—120 **8 Claims**

1. A light-stable olefin polymer composition comprising in combination an olefin polymer and minor proportions sufficient to improve the light-stability of said olefin polymer of each of (a) a hydroxybenzophenone having the structure



where R is an alkyl group of 1–10 carbon atoms, and (b) a bis-(dialkylphenyl)pentaerythritol diphosphite where the alkyl groups each contain 3–9 carbon atoms.

4,413,079

POWDER ENAMELS FREE OF BLOCKING AGENTS

Josef Disteldorf; Rainer Gras, and Horst Schnurbusch, all of Herne, Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,709

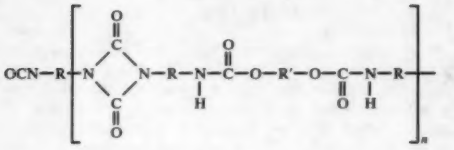
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030588

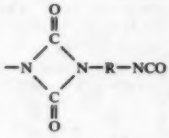
Int. Cl.³ C08L 75/00

U.S. Cl. 524—169 11 Claims

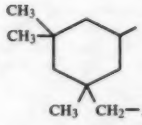
1. A storage-stable polyurethane powder enamel comprising a mixture of:

(a) an adduct of a uretidinedione dimer of isophorone diisocyanate and a diol having the following formula





wherein: R =



n≧1, and

R′=a divalent aliphatic, cycloaliphatic, araliphatic, or aromatic hydrocarbon radical, which is the residue of the diol,

wherein the ratio of NCO to OH groups in the formation of said adduct is from 1:0.5 to 1:0.9, the mole ratio of uretidinedione to diol is from 2:1 to 6:5, the content of free isocyanate groups in said adduct is not greater than 8% by weight, and said adduct has a molecular weight between 500 and 4000 and a melting point between 70° C. and 130° C., and

(b) a polyol having an OH-functionality of 2.2 to 3.5, an average molecular number of 30 to 100 mg KOH/g, a hydroxyl number of 30 to 100 mg KOH/g, a viscosity of <80,000 mPa.s at 160° C. and a melting point between 65° C. and 120° C.,

wherein the proportions of (a) and (b) are chosen so that the ratio of NCO groups in said adduct to OH groups in said polyol is between 0.8:1 and 1.2:1.

4,413,080

WATER-DISPERSIBLE PRESSURE-SENSITIVE ADHESIVE AND TAPE MADE THEREWITH

Frederick D. Blake, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Jun. 21, 1982, Ser. No. 390,638

Int. Cl.³ C09J 3/26, 5/02, 7/04

U.S. Cl. 524—187 7 Claims

1. Normally tacky and pressure-sensitive water-dispersible adhesive comprising the blended reaction product of

(a) 100 parts by weight of a copolymer of monomers consisting essentially of

(1) about 75–85 weight percent of at least one monomeric acrylic acid ester of nontertiary alkyl alcohol, and, correspondingly,

(2) about 25–15 weight percent of vinyl carboxylic acid,

(b) about 35–100 parts by weight of acidic rosin or rosin derivative,

(c) sufficient potassium hydroxide to neutralize about 30–45% of the combined carboxyl groups of the copolymer and rosin or rosin derivative,

(d) sufficient sodium hydroxide, lithium hydroxide, or a combination of sodium and lithium hydroxide to neutralize about 20–45% of said carboxyl groups, and

(e) about 100–225 parts by weight of oily plasticizing water-soluble polyoxyethylene compound.

4,413,081

POLYMER STABILIZATION

Ronald D. Mathis, and Jerry O. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 1, 1983, Ser. No. 462,848

Int. Cl.³ C08K 5/39

U.S. Cl. 524—202 12 Claims

1. A polymer composition exhibiting improved heat stability comprising a major amount of an arylene sulfide polymer containing a small effective stabilizing amount sufficient to retard polymer curing and cross-linking of at least one Group 8 metal dihydrocarbyldithiocarbamate.

4,413,082

WATER-SOLUBLE, PRESSURE SENSITIVE, SELF-ADHESIVE COMPOSITIONS AND ARTICLES MADE THEREWITH

Peter Gleichenhagen, and Ingrid Wesselkamp, both of Hamburg, Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 348,901

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105894

Int. Cl.³ C08K 5/17

U.S. Cl. 524—243 13 Claims

1. A water-soluble, pressure-sensitive self-adhesive composition comprising based on 100 parts by weight of solids,

(a) 30 to 80 parts by weight of a copolymer comprising

(i) 70 to 88% by weight acrylic acid butyl ester, and

(ii) 12 to 30% by weight vinyl carboxylic acid wherein (i) may be substituted in an amount of 3 to 12 weight % by acrylic acid-2-ethylhexyl ester and/or 5 to 25 weight % by a mixture of vinyl acetate and fumaric or maleic acid dialkyl ester, and

(b) 20 to 70 parts by weight of a water soluble plasticizer taken from the class consisting of ethoxylated phenols, ethoxylated alkyl phenols, ethoxylated alkyl mono- or diamines and ethoxylated alkyl ammonium compounds,

wherein said (ii) is substantially completely neutralized with KOH.

4,413,083

POLYARYLENE SULPHIDE COMPOSITIONS

Glyndwr J. Davies, Southall, England, assignor to The Glacier Metal Company Limited, Wembley, England

PCT No. PCT/GB81/00125, § 371 Date Mar. 3, 1982, § 102(e) Date Mar. 3, 1982, PCT Pub. No. WO82/00152, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 2, 1981, Ser. No. 359,664

Claims priority, application United Kingdom, Jul. 4, 1980, 8022067

Int. Cl.³ C08K 5/09

U.S. Cl. 524—299 9 Claims

1. A composition of matter comprising polyarylene sulphide

having a molecular weight in the range of between 5,000 and 17,500, intimately admixed with an aryl ester of an aryl alcohol in an amount sufficient to solvate said polyarylene sulphide.

4,413,084

PAINT COMPOSITION COMPRISING HYDROXY FUNCTIONAL FILM FORMER AND IMPROVED STABILIZED FLOW CONTROL ADDITIVE

Stanley K. Horvath, Rochester, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 199,776, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,794, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,805, Oct. 23, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 292,843

Int. Cl.³ C08F *255/06;* **C08G** *12/32;* **C08L** *61/28;* **C09D** *3/52*

U.S. Cl. 524—315 **26 Claims**

1. A coating composition comprising:

(I) a film forming component comprising hydroxy functional copolymer having a number average molecular weight ($\overline{M}_n$) of from greater than about 150 up to about 20,000 and a glass transition temperature (T_g) ranging from between about −25° C. and about 70° C., said copolymer being formed from about 5 to about 50 weight percent of hydroxy functional monoethylenically unsaturated monomers and between about 95 and about 50 weight percent of other monoethylenically unsaturated monomers;

(II) crosslinking agent selected from amino compounds and isocyanate compounds; and

(III) a flow control additive in an amount ranging from about 0.5 to about 30 parts of resin solids in said flow control additive per 100 parts of total resin solids in said composition, said flow control additive comprising a stable, crosslinked dispersion containing microgel particles, said dispersion

(i) being formed by addition polymerization of (a) between about 1 and about 10 mole percent each of first and second ethylenically unsaturated monomers each bearing functionality capable of crosslinking reaction with the other and (b) between about 98 and about 80 mole percent of at least one other monoethylenically unsaturated monomer in the presence of: (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer comprising the reaction product of ethylenically unsaturated monomers (A) and copolymer reactant (B),

said ethylenically unsaturated monomers (A) bearing functionality capable of condensation reaction with complementary functionality of said copolymer reactant (B) which comprises a random copolymer of

(x) between about 20 and about 45 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially insoluble in said organic liquid,

(y) between 40 and about 75 weight percent of ethylenically unsaturated monomers, homopolymers of which would be substantially soluble in said organic liquid; and

(z) between about 2 and about 15 weight percent of ethylenically unsaturated monomers bearing said complementary functionality capable of condensation reaction with said ethylenically unsaturated monomers (A),

said ethylenically unsaturated monomers (A) being reacted with said copolymer reactant (B) in an amount sufficient to react with at least about 10 percent of said complementary functionality of said copolymer reactant (B), wherein said addition polymerization is carried out at elevated temperature such that the dispersion polymer is first formed and then crosslinked; and

(ii) being stabilized further by inclusion therein of a further stabilizer which, except for solvent, consists essentially of butylated melamine formaldehyde resin having a number average molecular weight in the range of about 700 to about 2,500, said further stabilizer being included in said crosslinked dispersion in an amount ranging from about 25 to about 75 parts of resin solids per 100 parts of total resin solids in said crosslinked dispersion.

4,413,085

STORAGE STABLE POLYOLEFIN COMPATIBLE NON-CROSSLINKING SIZE FOR FIBER GLASS STRANDS

Chester S. Temple, McKees Rocks, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 191,792, Sep. 29, 1980, abandoned, which is a division of Ser. No. 935,275, Aug. 21, 1978, Pat. No. 4,248,935. This application Dec. 10, 1981, Ser. No. 329,442

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.³ C08K *5/09*

U.S. Cl. 524—321 **8 Claims**

1. An aqueous sizing composition to provide storage, stable glass fiber strands, consisting essentially of: coupling agents, surfactant, softener, ethylenically unsaturated carboxylic acid or anhydride stabilizer in an amount of about 1 to about 15 percent by weight of the solids of the sizing composition, a maleonated or acrylic modified polypropylene lubricant, and a non-crosslinkable homopolymer film forming polymer selected from the group consisting of epoxies, polyesters, polyurethanes, polyvinyl acetates, polyvinyl alcohols and acrylics, and water in an amount of about 80 to about 99 percent of the aqueous composition.

4,413,086

COATING COMPOSITIONS CONTAINING ORGANOSILANE-POLYOL

Wen-Hsuan Chang, Gibsonia, Pa.; Kyu-Wang Lee, Danville, Calif., and John B. Saunders, Jr., Allison Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 4, 1982, Ser. No. 354,561

Int. Cl.³ C08K *5/05*

U.S. Cl. 524—386 **15 Claims**

1. A water reducible coating composition comprising:

A. An organosilane-polyol havng a hydroxyl number equal to or greater than 70 which is a reaction product of

(1) a hydrophilic polyol having a hydroxyl number equal to or greater than 300; and

(2) an organosilicon material selected from the group consisting of an organosilane, a hydrolyzed and condensed organosilane, and a mixture thereof; and

B. a curing agent for said coating composition selected from the group consisting of an aminoplast resin, a phenoplast resin, and a blocked polyisocyanate.

4,413,087

STABLE POLYMER SOLUTIONS FOR SPRAY DRIFT CONTROL

Robert Bernot, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 23, 1982, Ser. No. 410,217

Int. Cl.³ C08K *5/05*

U.S. Cl. 524—389 **4 Claims**

1. A dilute solution of an acrylamide polymer having a molecular weight greater than 1,000,000 which is stable against viscosity loss reduction due to aging which comprises a major portion of water, from 0.01–3% by weight of an acrylamide polymer, and from 0.1–5% by weight of a water-soluble monohydric alcohol which contains from 1–3 carbon atoms.

3. A dilute solution of a high molecular weight acrylamide polymer which is stable against viscosity loss reduction due to aging which comprises a major portion of water, from 0.01–3% by weight of a high molecular weight acrylamide polymer, and from 0.1–5% by weight of a water-soluble monohydric alcohol which contains from 1–3 carbon atoms.

4,413,088

SILICONE RESIN COATING COMPOSITION ESPECIALLY SUITED FOR PRIMERLESS ADHESION TO CAST ACRYLICS

Robert B. Frye, Menands, N.Y., assignor to General Electric Co., Waterford, N.Y.

Continuation-in-part of Ser. No. 964,911, Nov. 30, 1978, Pat. No. 4,277,287. This application Apr. 27, 1979, Ser. No. 34,164

Int. Cl.³ C08K 5/06, 5/32 5/54; C08L 83/00

U.S. Cl. 524—714 21 Claims

1. An aqueous coating composition comprising:

(i) a dispersion of colloidal silica in an aqueous-organic solvent solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, wherein said organic solvent comprises aliphatic alcohol and a mixture of water miscible polar solvents which are aggressive to plastic in an amount sufficient to etch plastic; and

(ii) a small amount effective to control flow of a polysiloxane polyether copolymer;

said composition containing 10 to 40% solids, said solids consisting essentially of 10 to 70 weight % colloidal silica and 30 to 90 weight % of the partial condensate and wherein said composition has a pH of from 7.1 to about 7.8.

4,413,089

USE OF IRON OXIDE PIGMENTS IN A POLYMETHYL METHACRYLATE ARTICLE

Francis M. Gavin, Chadds Ford, and Anne M. Kruglewicz, Aston, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1982, Ser. No. 356,717

Int. Cl.³ C08K 3/10

U.S. Cl. 524—785 1 Claim

1. In a process for preparing a filled polymethyl methacrylate article, said article consisting essentially of 20 to 85% by weight alumina trihydrate and 15 to 80% by weight polymethyl methacrylate and having properties of translucency and an appearance of visual depth, said process comprising curing a polymerizable composition consisting essentially of polymerizable methyl methacrylate and alumina trihydrate, the improvement whereby a dispersion of iron oxide pigments having a particle size of 10 microns or less is prepared and blended thoroughly with said polymerizable composition prior to curing, whereby upon curing said article has properties of uniform color in addition to maintaining said properties of translucency and an appearance of visual depth.

4,413,090

CYANOETHYLATED OLEFIN-VINYL ALCOHOL COPOLYMER AND DIELECTRIC MATERIAL AND ADHESIVE COMPRISING THE SAME

Masuhiro Shoji; Teruo Sakagami, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1982, Ser. No. 366,031

Claims priority, application Japan, Apr. 6, 1981, 56-50516; Apr. 7, 1981, 56-51243

Int. Cl.³ C08F 8/30

U.S. Cl. 525—59 5 Claims

1. A cyanoethylated olefin-vinyl alcohol copolymer containing 10 to 70 mol percent olefin content, wherein the olefin has from 2 to 4 carbon atoms.

4,413,091

PHOTOSENSITIVE POLYMER AND PHOTOSENSITIVE MATERIAL FOR PHOTOMECHANICAL PROCESS

Hidenori Iwasaki, Samukawa; Yukio Urata, Hino, and Shunichi Kasukawa, Yamato, all of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 31, 1981, Ser. No. 336,058

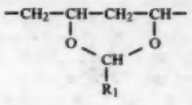
Claims priority, application Japan, Jan. 20, 1981, 56-005910

Int. Cl.³ C08F 8/30

U.S. Cl. 525—61 14 Claims

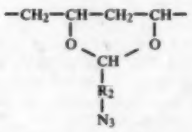
1. A polyvinyl alcohol derivative characterized as being a solid at ambient temperature and composed of a recurring structural unit comprising

(a) from 5 to 40% by mole of a structural unit represented by the general formula



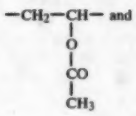
in which R_1 is a hydrogen atom or an alkyl group;

(b) from 5 to 35% by mole of a structural unit represented by the general formula



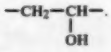
in which R_2 is an aryl group;

(c) from 1 to 45% by mole of a structural unit represented by the formula



and

(d) from 1 to 60% by mole of a structural unit represented by the formula



4,413,092

VINYL HALIDE POLYMER BLENDS OF ENHANCED IMPACT RESISTANCE

Gilbert Witschard, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 92,119, Nov. 7, 1979, abandoned, which is a continuation of Ser. No. 901,913, May 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 892,226, Mar. 31, 1978, Pat. No. 4,192,828, which is a continuation-in-part of Ser. No. 881,949, Feb. 28, 1978, abandoned, which is a continuation of Ser. No. 172,929, Jul. 28, 1980, Pat. No. 4,319,002. This application Feb. 24, 1982, Ser. No. 351,792

Int. Cl.³ C08L 27/06, 53/02, 55/02

U.S. Cl. 525—71 14 Claims

1. In a vinyl halide polymer composition which is capable of being molded to an impact resistant article and which com-

prises a blend of a vinyl halide polymer wherein the major proportion of the monomer units are vinyl halide monomer residues and an acrylonitrile-1,3-butadiene-styrene polymeric impact modifier for polyvinyl halide, said modifier comprising (1) a mixture of a copolymer of styrene and acrylonitrile with a minor amount of a copolymer of acrylonitrile and 1,3-butadiene, or (2) a mixture of a copolymer of styrene and acrylonitrile with a minor amount of a graft of said strene-acrylonitrile copolymer onto poly-1,3-butadiene,

the improvement wherein the blend also comprises a block thermoplastic elastomer wherein the major proportion of the monomer units are residues of (1) a mono-alkenyl-substituted aromatic compound of the benzene or naphthalene series of 8 to 20 carbon atoms and (2) a conjugated alkadiene hydrocarbon of 4 to 10 carbon atoms, said block elastomer being normally incompatible with said vinyl halide polymer, said vinyl halide polymer being present in a proportion of about 50 to about 99 weight percent in said blend, and said acrylonitrile-1,3-butadiene-styrene polymeric modifier and said block elastomer together being present in a proportion of about one to about 50 weight percent in said blend.

4,413,093

METHOD OF STABILIZING A POLYMER FROM DEGRADATION BY UV RADIATION

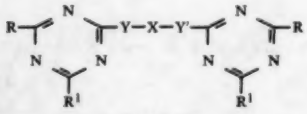
Frank F. Loffelman, Bridgewater, and Thomas E. Brady, Hunterdon County, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 285,239, Jul. 20, 1981. This application Feb. 16, 1983, Ser. No. 467,107

Int. Cl.³ C08L *39/04*

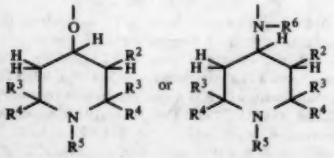
U.S. Cl. 525—185 **6 Claims**

1. A method for stabilizing a polymer which is normally subject to degradation by ultraviolet radiation which comprises incorporating into said polymer an ultraviolet stabilizingly effective amount of a polymer prepared by polymerizing, optionally with a comonomer, a compound of the formula (I)

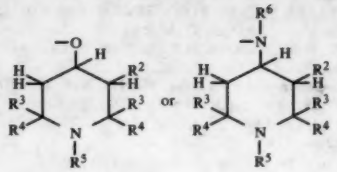


(I)

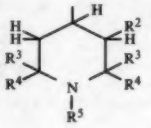
wherein R represents C_3–C_1 alkenyloxy, C_3–C_6 alkenylamino, or di(C_3–C_6 alkenyl)amino; R^1 represents C_1–C_8 alkyl, C_1–C_8 alkoxy, halo, C_1–C_8 alkylthio, C_3–C_6 alkenyloxy, amino, C_3–C_6 alkenylamino, di(C_3–C_6 alkenyl)amino, the groups



C_1–C_{18} alkylamino, di(C_1–C_{18})alkylamino, morpholino, pyrrolidyl, piperidino, a substituted C_1–C_{18} alkylamino, or a substituted di(C_1–C_{18})alkylamino, wherein the substituents are selected from amino, cyano, carboxy, alkoxycarbonyl wherein the alkoxy moiety has 1 to 8 carbon atoms, and the group



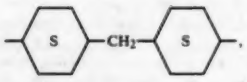
wherein R^2 represents hydrogen, C_1–C_8 alkyl, or benzyl; R^3 and R^4 independently represent C_1–C_8 alkyl, benzyl or phenethyl, or together with the carbon to which they are attached form a C_5–C_{10} cycloalkyl; and R^5 represents hydrogen, C_2–C_3 hydroxylalkyl, C_1–C_8 alkyl, hydroxyl, or oxyl; R^6 represents hydrogen, C_1–C_8 alkyl, or the group

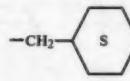


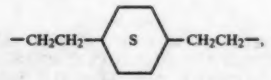
Y and Y', which may be the same, or different, represent oxy, or

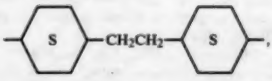
X represents C_2–C_{12} alkylene, wherein the alkylene chain may be interrupted by an oxo, thio or

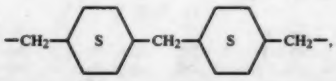
radical, C_5–C_{10} cycloalkylene,











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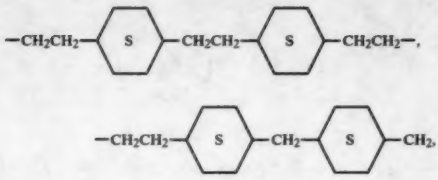
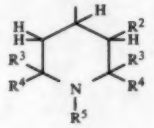


C_6–C_{12} arylene, or C_8–C_{14} aralkylene; with the proviso that at least one substituent in said compound is, or contains,



4,413,094

PERFLUOROELASTOMER BLENDS

Carl A. Aufdermarsh, Jr., Newark, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Sep. 29, 1982, Ser. No. 427,412
Int. Cl.³ C08L *27/18, 71/00*
U.S. Cl. 525—187 **8 Claims**

1. A co-vulcanizable fluoroelastomer blend consisting essentially of

(a) 50–95 weight percent of at least one tetrafluoroethylene/perfluoro-(methylvinyl ether)/cure-site monomer terpolymer and

(b) 5–50 weight percent of at least one hexafluoropropylene oxide/cure-site monomer dipolymer,

wherein the reactive functional group of the cure-site monomer in the terpolymer is the same as in the dipolymer and is selected from the group consisting of $—C_6F_5$ and —CN.

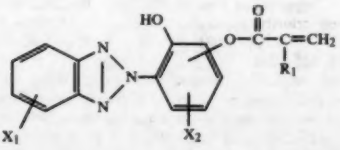
4,413,095

VINYLIDENE FLUORIDE RESIN-BASED SHAPED PRODUCT

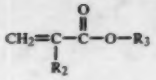
Toshiya Mizuno, and Naohiro Murayama, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,436
Claims priority, application Japan, Nov. 20, 1981, 56-186234
Int. Cl.³ C08L *27/16, 33/08, 33/14*
U.S. Cl. 525—199 **9 Claims**

1. A vinylidene fluoride resin-based shaped product of a composition comprising 100 parts by weight of a vinylidene fluoride resin and from 1 to 200 parts by weight of a copolymer comprising a monomer (A) having the formula:



wherein R_1 is H or CH_3, and X_1 and X_2 are each a saturated hydrocarbon group containing from 1 to 4 carbon atoms, H or halogen and a monomer (B) having the formula:



wherein R_2 is H or CH_3 and R_3 is a saturated hydrocarbon group containing from 1 to 5 carbon atoms, the molar ratio of the monomer (A) to the monomer (B) being not more than 1, and the monomer (A) which is a constituent unit of said copolymer being present in a quantity of at least 1×10^{-4} moles per square meter of light-receiving area of said shaped product.

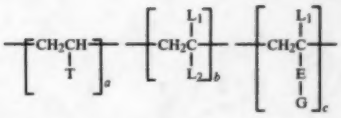
4,413,096

α-OLEFIN COPOLYMERS CONTAINING PENDANT HINDERED AMINE GROUPS

Frank T. Fu, Taipei, Taiwan, and Roland A. E. Winter, Armonk, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 253,484, Apr. 13, 1981, abandoned. This application Jan. 26, 1982, Ser. No. 342,876
Int. Cl.³ C08L *75/04, 39/04, 77/00*
U.S. Cl. 525—204 **20 Claims**

1. An α-olefin copolymer having recurring structural units, joined in essentially a random fashion, of the formula I



(I)

wherein

T is hydrogen, alkyl of 1 to 18 carbon atoms or mixtures thereof,

L_1 is hydrogen or methyl,

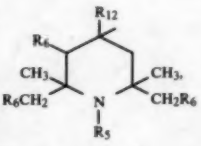
L_2 is hydroxyl, $—OCOCH_3$ or $—COOL_3$,

L_3 is hydrogen or alkyl of 1 to 6 carbon atoms,

E is —COO—, —OCO—, —O— or —CONR—,

R is hydrogen, alkyl of 1 to 12 carbon atoms, aralkyl of 7 to 12 carbon atoms, cyclohexyl, hydroxyalkyl of 1 to 6 carbon atoms, alkoxyalkyl of 2 to 10 carbon atoms or dialkylaminoalkyl of 3 to 12 carbon atoms,

G is a group containing an N-heterocyclic ring of the formula



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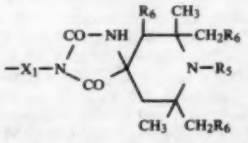
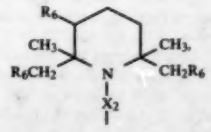


(III)



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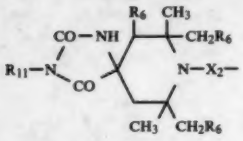

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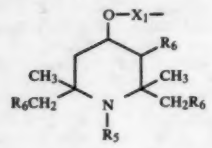
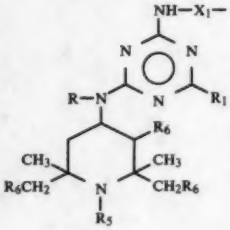
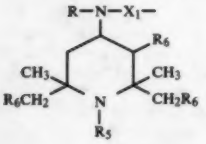
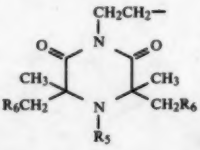


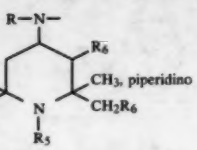




or



in which R_5 is hydrogen, oxyl, C_1–C_{18} alkyl, C_3–C_8 alkenyl, C_3–C_6 alkynyl, C_7–C_{12} aralkyl, $—CH_2CN$, C_2–C_{21} alkoxyalkyl, an aliphatic acyl group having 1–4 carbon atoms or one of the groups $—CH_2COOR_7$ or $—COOR_8$ in which R_7 is C_1–C_{12} alkyl, C_3–C_8 alkenyl, phenyl, C_7–C_8 aralkyl or cyclohexyl, and R_8 is C_1–C_{12} alkyl, phenyl, benzyl or cyclohexyl, and R_6 is hydrogen or C_1–C_4 alkyl and X_1 is C_3–C_{12} alkylene, $—CH_2CH_2OCH_2CH_2—$ or a group of the formula $—CH(R_{10})—CH_2—$ (VI), in which R_{10} is hydrogen, methyl, ethyl, phenoxymethyl or phenyl, and X_2 is a group of the formula VI, in which R_{10} is as defined above, or a group of the formula $—CH_2—CH(OH)—CH_2—$ (VII), R_{11} is C_1–C_{18} alkyl or is cyclohexyl, phenyl or benzyl which are unsubstituted or substituted by C_1–C_4 alkyl or C_1–C_4 alkoxy, R_1 is alkoxy of 1 to 12 carbon atoms, phenoxy,



or NR_2R_3 where R_2 and R_3 are hydrogen, alkyl of 1 to 12 carbon atoms, cyclohexyl or benzyl, R_{12} is hydrogen or hydroxyl, with the proviso that, when R_{12} is hydroxyl, E is —OCO—,

a+b+c=4 to 2600
a=2 to 2400
b=0 to 198
c=2 to 200
a/a+b+c=0.50 to 0.99
b/a+b+c=0 to 0.49, and
c/a+b+c=0.01 to 0.50.

4,413,097

POLYMER COMPOSITIONS OF LDPE AND E/P COPOLYMER

Kazuo Matsuura, Tokyo; Noboru Yamaoka; Shinichi Yanahashi, both of Yokohama; Katumi Usui, Yokosuka, and Mituji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company, Ltd., Japan

Continuation-in-part of Ser. No. 257,647, Apr. 27, 1981, abandoned. This application Apr. 20, 1982, Ser. No. 370,272
Claims priority, application Japan, Apr. 30, 1980, 55-56363
Int. Cl.³ C08L *23/16, 23/06*
U.S. Cl. 525—240 **5 Claims**

1. A polymer composition having a melt index of 0.01 to 5.0 and a density of 0.870 to 0.940, said polymer composition comprising a blend of:

(1) 30 to 80 parts by weight of an ethylene/propylene copolymer having an intrinsic viscosity determined in decalin at 135° C. of 5.0 to 10 dl/g and a density in the range of from 0.850 to 0.930 which copolymer is obtained by copolymerizing ethylene with propylene in a substantially liquid solvent-free vapor phase condition and in the presence of a catalyst comprising a solid substance and an organoaluminum compound, said solid substance containing magnesium and titanium and/or vanadium, and

(2) 70 to 20 parts by weight of a high-pressure process polyethylene having an intrinsic viscosity determined in decalin at 135° C. of not higher than 0.7 dl/g and a density of 0.915 to 0.935.

4,413,098

ISOPRENE-BUTADIENE COPOLYMER RUBBER HAVING IMPROVED PROCESSING PROPERTIES

Yasuo Hattori; Takeshi Ikematu, both of Yokohama; Toshio Ibaragi, Kawasaki, and Makoto Honda, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 61,248, Jul. 27, 1979, abandoned. This application Sep. 16, 1981, Ser. No. 302,787
Claims priority, application Japan, Aug. 18, 1978, 53-100006
Int. Cl.³ C08F *297/04, 236/08, 236/10*
U.S. Cl. 525—314 **4 Claims**

1. An isoprene-butadiene copolymer rubber having improved processing properties which comprises a microstructure of the butadiene portion having from 70% to 90% of trans-1,4 linkage and from 2% to 8% of vinyl linkage, an isoprene content of from 3 to 25 wt %, and a styrene content of from 0 to 30 wt %, said copolymer rubber having a Mooney Viscosity of from 30 to 150, and a molecular weight distribution, Mw/Mn of from 1.2 to 3.5, said rubber, in the unelon-

gated state, not exhibiting a melting point measured by the differential scanning calorimeter analysis method.

4. The isoprene-butadiene copolymer rubber as claimed in claim 1 or 2, wherein the isoprene is substantially block copolymerized.

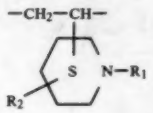
4,413,099

POLYMER COMPOSITION AND PROCESS FOR PREPARING SAME

Edward E. Sowers, Mooresville; Gerald L. Goe, Greenwood, and Michael L. Prunier, Greenfield, all of Ind., assignors to Reilly Tar & Chemical Corp., Indianapolis, Ind.

Filed Sep. 10, 1981, Ser. No. 301,040
Int. Cl.³ C08F 8/04
U.S. Cl. 525—327.1 **46 Claims**

1. A polymer composition comprised substantially of monomeric units having the formula



or its acid salt, wherein:

R_1 is an alkyl group having from 1 to about 20 carbon atoms or an arylalkyl group having from 7 to about 12 carbon atoms; and

R_2 is hydrogen or an alkyl group having from 1 to about 10 carbon atoms.

4,413,100

ALKYLATED METHYLOL MELAMINE RESIN CONDENSATE COMPOSITIONS HAVING LOW FORMALDEHYDE RELEASE

William F. Herbes, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 429,901
Int. Cl.³ C08G 6/00; C08L 61/02
U.S. Cl. 525—398 **1 Claim**

1. A methylated methylol melamine resin condensate composition exhibiting reduced release of formaldehyde when textile materials treated therewith are exposed to elevated temperatures, which comprises a methylated methylol melamine resin condensate represented by the empirical formula:

$$MF_{3.4}Me_{0.5\text{-}3}$$

wherein M represents a melamine moiety, F represents a formaldehyde moiety and Me represents a methyl group moiety, and from about 5 to about 30 percent by weight, based on the resin solids content of said condensate, of urea.

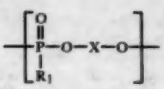
4,413,101

THERMOPLASTIC POLYURETHANE COMPOSITIONS OF IMPROVED FLAME RETARDANCE

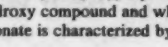
Manfred Schmidt, Krefeld, Fed. Rep. of Germany, and Robert P. Yeater, Moundsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1981, Ser. No. 318,730
Int. Cl.³ C08F 283/00
U.S. Cl. 525—440 **5 Claims**

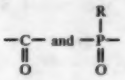
1. A thermoplastic molding composition comprising thermoplastic polyurethane and a high molecular weight resin selected from the group consisting of polyarylphosphonate and polyarylphosphonatocarbonate wherein said polyarylphosphonate is characterized by the recurring structural units



wherein R_1 is C_6–C_{30} aryl and X is an aromatic residue of a dihydroxy compound and wherein said polyarylphosphonatocarbonate is characterized by the recurring structural units



wherein E denotes H or —M—O—Ar and where Ar is a C_6–C_{14} aryl radical and M denotes



having a molar ratio of between 5:95 to 95:5 and R denotes a C_6 to C_{30} aryl and X_1 denotes a residue of a dihydroxy compound.

4,413,102

COMPOSITION FOR PROTECTING CEMENTWARE FROM FROST-DAMAGE COMPRISING URETHANE RESIN AND ORGANOPOLYSILOXANE

Michio Tanaka, Takatsuki; Kohji Nasu, and Tetsuaki Kanemoto, both of Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 133,291, Mar. 24, 1980, Pat. No. 4,330,595.
This application Jan. 28, 1982, Ser. No. 344,080
Claims priority, application Japan, Mar. 26, 1979, 54-35791
Int. Cl.³ C08L 75/04
U.S. Cl. 525—453 **7 Claims**

1. A composition for protecting cementware from frost-damage, which comprises a moisture-cure type urethane resin coating and a web-like or three-dimensionally structured organopolysiloxane compound represented by the rational formula

$$R_2Si_2O_3$$

wherein R is alkyl of not less than 4 carbon atoms or hydroxyalkyl of about 0.5 to 50 parts by weight relative to 100 parts by weight of resin portion in the urethane resin coating.

4,413,103

HALOGEN-CONTAINING POLYCARBONATE RESIN AND PROCESS FOR PRODUCING SAME

Kohyama Katsuhisa; Nakamura Katsuhiko, and Matsuno Akira, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries., Ltd., Tokyo, Japan

Filed Feb. 25, 1982, Ser. No. 352,187
Claims priority, application Japan, Mar. 20, 1981, 56-41079
Int. Cl.³ C08L 69/00; C08G 63/62
U.S. Cl. 525—469 **13 Claims**

1. A halogen-containing polycarbonate resin formed by copolymerizing an admixture of monomers consisting essentially of the following oligomers (a) and (b) in the presence of caustic alkali, an organic solvent, water and in the substantial absence of residual bisphenol A and in the absence of added bisphenol A;

(a) 10 to 85 parts by weight of a polycarbonate oligomer with terminal groups consisting of chloroformate groups or chloroformate groups plus hydroxyl groups less in a molar amount than the chloroformate groups, having a number average molecular weight of 500 to 10,000 and

containing no aromatic halogen or less than 4% by weight of aromatic halogen, and

(b) constituting the balance for a total of 100 parts by weight of oligomer, an aromatic halogen-containing polycarbonate oligomer with terminal groups consisting of chloroformate groups or chloroformate groups plus hydroxyl groups less in a molar amount than the chloroformate groups, having a number average molecular weight of 1,000 to 10,000 and containing 6 to 30% by weight or aromatic halogen.

4,413,104

PROCESS FOR PREPARING ORGANOPOLYSILOXANES AND COPOLYMERS THEREOF

Bernward Deubzer, Burghausen; Norbert Egerter, Emmerting, and Volker Frey, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,140

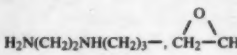
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106186

Int. Cl.³ C08F *283/00*

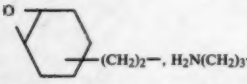
U.S. Cl. 525—479 **9 Claims**

5. A process for preparing a modified organopolysiloxane polymer which comprises copolymerizing a monomer or polymer containing aliphatic double bonds with an organopolysiloxane which is obtained from the reaction of an organopolysiloxane having Si-bonded groups selected from the class consisting of hydroxyl groups, alkoxy groups and mixtures thereof and having an average of from 0.85 to 1.8 SiC-bonded radicals selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals per silicon atom and an organosilicon compound having Si-bonded groups selected from the class consisting of alkoxy groups, ≡Si—O—Si≡ groups and mixtures thereof, and at least one SiC-bonded organofunctional radical per molecule, in which the SiC-bonded organofunctional radical is selected from the group consisting of

$CH_2{=}CH{-}$, $CH_2{=}C(CH_3)COO(CH_2)_3{-}$, $HS(CH_2)_3{-}$,



$H_2N(CH_2)_2NH(CH_2)_3{-}$, $CH_2{-}CHCH_2O(CH_2)_3{-}$,



$(CH_2)_2{-}$, $H_2N(CH_2)_3{-}$, $H_2NC_6H_4{-}$,

$HO(CH_2)_3{-}$ and $Cl(CH_2)_3{-}$

in the presence of an organic solvent and a catalyst selected from the group consisting of alkali metal carbonates, alkali metal hydroxides, alkali metal alcoholates, alkali metal oxyacylates, potassium methylsiliconate and quaternary ammonium compounds at the reflux temperature of the solvent at atmospheric temperature.

4,413,105

STABILIZED THERMOSETTABLE ETHYLENICALLY UNSATURATED EPOXY ESTER RESIN COMPOSITIONS

Raymond Koenig, Vendenheim, France, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 12, 1982, Ser. No. 377,495

Claims priority, application European Patent Office, May 15, 1981, 81-103738

Int. Cl.³ C08L *61/12*; C08G *283/10*; C08L *63/10*

U.S. Cl. 525—482 **6 Claims**

1. A thermosettable ethylenically unsaturated epoxy ester resin composition having improved storage stability comprising the reaction product of a bisphenol-base epoxy resin, a novolac-base epoxy resin, or mixtures thereof with an ethylenically unsaturated monocarboxylic acid dissolved in a polymerizable monomer containing a $>C{=}CH_2$ group and an anaerobically effective polymerization selected from the group consisting of 4-chloro-2-nitrophenol, 2,4-dichloro-6-nitrophenol, and mixtures thereof.

4,413,106

HETEROGENEOUS SULFONATION PROCESS FOR DIFFICULTLY SULFONATABLE POLY(ETHER SULFONE)

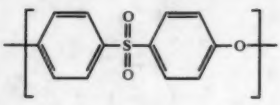
Myron J. Coplan, Natick, and Gertrud Götz, Brookline, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,162

Int. Cl.³ C08G *65/48, 75/23*

U.S. Cl. 525—534 **3 Claims**

1. A process for the sulfonation of a poly(ether sulfone) consisting essentially of repeating units of the formula:



which comprises;

providing said poly(ether sulfone) in the form of a polymer/-solvent intercrystalline solid, suspended in a fluid, chlorinated hydrocarbon; and

sulfonating the solid form in said suspension at a temperature within the range of from −50° to +80° C. with a sulfonating agent in sufficient proportion to obtain a ratio of the number of sulfur atoms in the sulfonation agent to the number of sulfur atoms in the polymer, which is within the range of between 0.4:1 to 5:1.

4,413,107

IMIDO THERMOSETTING COMPOSITIONS STORAGE-STABILIZED AGAINST RECRYSTALLIZATION OF BIS-IMIDES THEREFROM

Jean-Louis Locatelli, Vienne, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 223,715, Jan. 9, 1981, abandoned. This application Feb. 6, 1981, Ser. No. 232,253

Claims priority, application France, Jan. 9, 1980, 80 00369

Int. Cl.³ C08F *26/06*

U.S. Cl. 526—262 **11 Claims**

1. In a thermosetting composition, homogeneous at ambient temperature, and comprising the prepolymerization product obtained by reacting (i) an N,N′-diphenylene-bis-imide with (ii) at least one non-imido comonomer copolymerizable therewith, the improvement which comprises, as storage-stabilizer therefor, (iii) a bis-imide recrystallization preventing amount of an N,N′-tolylene-bis-maleimide.

4,413,108

ANAEROBICALLY-CURING COMPOSITIONS

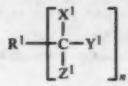
Edward W. Janssen, Roseville, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 203,683, Nov. 3, 1980, abandoned. This application Aug. 3, 1981, Ser. No. 289,702

Int. Cl.³ C08F *20/20*

U.S. Cl. 526—301 **16 Claims**

1. An anaerobically-curing composition comprising a first part and a second part, with at least one of said first part and said second part comprising as a major constituent a polymerizable monomer having at least one of α,β-unsaturated carboxyl functionality per molecule of monomer, and with said first part comprising as a first initiator component a halogen-containing compound selected from the group consisting of compounds of the formula



wherein:

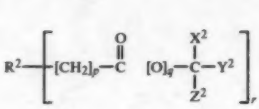
X^1 is selected from the group consisting of H, CH_3, Cl, and Br;

Y^1 and Z^1 are each selected independently from the group consisting of Cl and Br;

R^1 is selected from the group consisting of aromatic and heteroaromatic residues; and

n is an integer from 1 to 3 inclusive;

compounds of the formula



wherein

X^2 is selected from the group consisting of H, Cl, Br and CN;

Y^2 and Z^2 are each selected independently from the group consisting of Cl and Br;

R^2 is selected from the group consisting of $—NH_2$, an alkyl radical comprising 1 to about 10 carbons, an aryl radical comprising 1 to about 10 carbons, a methoxy-substituted aryl radical comprising 1 to about 10 carbons and a methyl-substituted aryl radical comprising 1 to about 10 carbons;

p is 0 or 1;

q is 0 or 1; and

r is 1 or 2; and

1,trichloromethyl-cis-perhydropentalene; and

1,1,1-trichloro-2-methyl-2-propanolhydrate;

and with said second part comprising as a second initiator component an organic thiol selected from the group consisting of a compound of the formula

wherein:

R^4 is an unsubstituted hydrocarbon group of 1 to about 20 carbons;

a mercapto ester, 2,3-dimercaptosuccinic acid, thiomalic acid, oxydibenzyl mercaptan, and pentachlorothiophenol.

4,413,109

EMBOSSED FILMS OBTAINED FROM ETHYLENE-PROPYLENE COPOLYMERS, AND A PROCESS AND APPARATUS FOR MANUFACTURING THE FILMS

Armand Haas, Mazingarbe, France, assignor to Societe Chimique des Charbonnages-CdF Chimie, Paris La Defense, France

Continuation of Ser. No. 232,589, Feb. 9, 1981, abandoned. This application Mar. 20, 1981, Ser. No. 245,757

Claims priority, application France, Feb. 8, 1980, 80 02748

Int. Cl.³ B29D *7/14;* **C08F** *210/16*

U.S. Cl. 526—348 **1 Claim**

1. An embossed film comprising an ethylene-propylene copolymer, said embossed film having a thickness of less than or equal to 24 microns, and said ethylene-propylene copolymer having a density (ρ) between 0.900 and 0.935 g/cm^3, a melt index between 0.4 and 2 dg/mn, a proportion (m) of methyl groups between 22 and 62 per 1000 carbon atoms, and wherein ρ and m are such that $0.9534 \leq \rho + 0.83m \leq 0.9568$.

4,413,110

HIGH TENACITY, HIGH MODULUS POLYETHYLENE AND POLYPROPYLENE FIBERS AND INTERMEDIATES THEREFORE

Sheldon Kavesh, Whippany, and Dusan C. Prevorsek, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 259,266, Apr. 30, 1981, abandoned. This application Mar. 19, 1982, Ser. No. 359,019

Int. Cl.³ C08F *10/02, 10/06;* **D01F** *6/04, 6/06*

U.S. Cl. 526—348.1 **19 Claims**

1. A stretched polyethylene fiber of substantially indefinite length being of weight average molecular weight at least about 500,000 and having a tenacity of at least about 20 g/denier, a tensile modulus at least about 500 g/denier, a creep value no more than about 5% (when measured at 10% of breaking load for 50 days at 23° C.), a porosity less than about 10% and a main melting temperature of at least about 147° C. (measured at 10° C./minute heating rate by differential scanning calorimetry).

13. A stretched polypropylene fiber of substantially indefinite length being of weight average molecular weight of at least about 750,000 and having a tenacity of at least about 8 g/denier, a tensile modulus of at least about 160 g/denier and a main melting temperature of at least about 168° C. (measured at 10° C./minute heating rate by differential scanning calorimetry).

4,413,111

ISOCYANATE-TERMINATED PREPOLYMERS WITH LOW FREE MONOMER CONTENTS

Peter H. Markusch, McMurray, Pa., and Terry A. Potter, New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 426,301

Int. Cl.³ C08G *18/10*

U.S. Cl. 528—59 **14 Claims**

1. A process for the preparation of an isocyanate-terminated prepolymer having a content of unreacted diisocyanate of less than 2% by weight, based on the weight of said isocyanate-terminated prepolymer, and containing internal urethane groups based on 4,4'-diisocyanato-dicyclohexyl-methane which comprises

(a) preparing an OH-terminated prepolymer from

(i) a high molecular weight polyol component, and/or

(ii) a low molecular weight isocyanate-reactive component, and

(iii) a polyisocyanate component comprising 4,4'-diisocyanate-dicyclohexyl-methane

at an NCO/OH equivalent ratio of about 0.5:1 to 0.9:1;

(b) forming said isocyanate-terminated prepolymer by reacting said OH-terminated prepolymer with a polyisocyanate other than 4,4'-diisocyanato-dicyclohexyl-methane containing aromatically-, aliphatically- and/or cycloaliphatically-bound isocyanate groups at an NCO:OH equivalent ratio, based on the free —OH groups of component (a), of about 1.6:1 to 15:1; and

(c) reducing the amount of unreacted diisocyanate to less than about 2% by weight, based on the weight of said isocyanate-terminated prepolymer.

4,413,112
EMULSIFIERS, AQUEOUS ISOCYANATE EMULSIONS CONTAINING THEM AND THEIR USE AS BINDERS IN A PROCESS FOR THE MANUFACTURE OF MOLDED ARTICLES

Helmut Reiff, Leverkusen, and Hanns I. Sachs, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 16, 1980, Ser. No. 150,487

Claims priority, application Fed. Rep. of Germany, May 29, 1979, 2921681

Int. Cl.³ C08G *18/28*

U.S. Cl. 528—73 **4 Claims**

1. Emulsifiers comprising

$$R—X—(CH_2—CH_2—O)_n—CO—NH—Y$$

wherein

X is selected from the group consisting of —O—,

—CH_2—O— or —S—,

n represents a number from 10 to 50,

R′ represents a C_1–C_3 alkyl group,

R represents a radical selected from the group consisting of an aromatic radical having 6 to 9 carbon atoms, a cycloaliphatic radical having 3 to 9 carbon atoms and a heterocyclic radical having from 2 to 9 carbon atoms in the ring, and

Y represents a group obtained by removal of an isocyanate group from an organic polyisocyanate.

4,413,113
CONTINUOUS PRODUCTION OF PHENOL-FORMALDEHYDE RESIN AND LAMINATES PRODUCED THEREFROM

Paul J. Gelling, Whitley Bay; James E. B. Hunt, Staines, and John D. Marshman, Wokingham, all of England, assignors to Formica Limited, North Shields, England

Filed Mar. 17, 1982, Ser. No. 358,780

Claims priority, application United Kingdom, Apr. 3, 1981, 8110533

Int. Cl.³ C08G *8/10*

U.S. Cl. 528—165 **6 Claims**

1. A process for the continuous production of water-soluble, phenol-formaldehyde resins comprising:

(a) continuously producing a slurry of molten phenol and particulate paraformaldehyde,

(b) mixing said slurry with an alkaline catalyst,

(c) reacting the resultant mixture in a coil container which is of sufficient length to enable substantially complete reaction of the phenol and paraformaldehyde to a water-soluble resinous state and which is immersed in a fluid at a temperature of from 90° C. to 120° C., for a period of time such that a clear, viscous, homogeneous, liquid resin solution is formed

(d) cooling said homogeneous, liquid, resin solution to a temperature such that reaction between the phenol and paraformaldehyde is suppressed and

(e) recovering the resultant resin, in the absence of water removal, as a solution of at least 70% solids.

4,413,114
AROMATIC COPOLYAMIDE CONTAINING 3,4′-DIPHENYLENE MOIETY

Keizo Shimada; Hiroshi Mera; Noriaki Sasaki, and Akihiro Aoki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

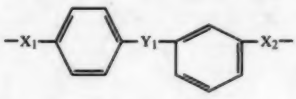
Continuation of Ser. No. 120,992, Feb. 13, 1980, Pat. No. 4,355,151. This application Mar. 30, 1982, Ser. No. 363,485

Claims priority, application Japan, Feb. 26, 1979, 54-20685

Int. Cl.³ C08G *69/32*

U.S. Cl. 528—183 **10 Claims**

1. A fiber- or film-forming aromatic copolyamide which comprises at least one recurring unit (A) of the formula (I), at least one recurring unit (B) of the formula (II) and at least one recurring unit (C) of the formula (III):

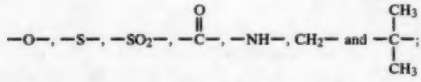


(I)

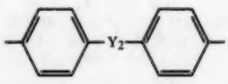
$$—X_3—Ar_1—X_4—$$ (II)

$$—X_5—Ar_2—X_6—$$ (III)

in which formulae (I), (II) and (III), Y_1 represents a divalent radical selected from the group consisting of



Ar_1 represents a member selected from the group consisting of phenylene, naphthylene and biphenylene radicals, each having two valence bonds oriented meta; Ar_2 represents a member selected from the group consisting of phenylene, naphthylene and biphenylene radicals, each having two valence bonds oriented coaxially or in parallel to each other and radicals of the formula (IV):



(IV)

wherein Y_2 represents a divalent radical selected from the same group as that set forth above for Y_1 and is the same as or different from Y_1; and X_1 and X_2 respectively represent a —NH— moiety of X_3, X_4, X_5 and X_6 respectively represent a moiety —NH— or —CO— of an amide group —NHCO— or —CONH— and the molar proportions of said recurring units (A), (B) and (C) represented by a triangular composition diagram fall on or within the quadrilateral shown in FIG. 1 and defined by the co-ordinates:

P (A 50, B 5, C 45)

Q (A 5, B 5, C 90)

R (A 5, B 40, C 55) and

S (A 50, B 15, C 35)

except for the side defined by the coordinates P, Q.

4,413,115
COPOLYIMIDES-POLYAMIDES FROM ALIPHATIC AND AROMATIC ANHYDRIDES, DICARBOXYLIC ACIDS, AND DIAMINES

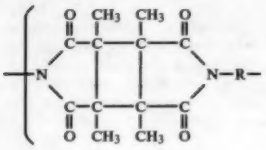
Tayseer S. Nimry, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

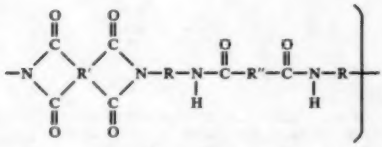
Continuation-in-part of Ser. No. 286,697, Jul. 24, 1981, Pat. No. 4,366,304. This application Sep. 29, 1982, Ser. No. 427,018

Int. Cl.³ C08G 73/10

U.S. Cl. 528—189 8 Claims

1. A copolyimide-polyamide comprising the following recurring structure:





wherein R and R'' are the same or different divalent aliphatic or aromatic hydrocarbon radicals and R' a tetravalent aliphatic or aromatic radical.

4,413,116
PROCESS FOR THE PREPARATION OF POLYESTERS OR ALKYD RESINS, RESINS WHICH MAY BE OBTAINED ACCORDING TO THIS PROCESS AND THE USE THEREOF AS LACQUER BINDERS

Knud Reuter; Rolf Dhein, and Lothar Fleiter, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,584

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115072

Int. Cl.³ C08G 63/12, 63/48; C09D 3/64

U.S. Cl. 528—307 8 Claims

1. A process for the preparation of polyesters, which are optionally modified with fatty acids, from di- to hexahydric alcohols, polycarboxylic acids (or the derivatives thereof capable of esterification), optionally monocarboxylic acids and/or monohydric alcohols, characterised in that

(a) at least 10% by weight of all the alcohols used consist of penta— or hexahydric sugar alcohols, and

(b) from 50 to 100% by weight of all the polycarboxylic acid components used consist of cycloaliphatic polycarboxylic acids or the derivatives thereof capable of esterification, provided that the polycarboxylic acid components used do not contain more than 50% by weight of aromatic polycarboxyl :cids or the derivatives thereof capable of esterification.

4,413,117
PREPARATION OF POLYIMIDE POWDER

Udo Reiter, Mutterstadt; Jenoe Kovacs, Bobenheim-Roxheim, and Hans-Uwe Schenck, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,273

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1981, 3124401

Int. Cl.³ C08G 73/10

U.S. Cl. 528—497 4 Claims

1. A process for the preparation of polyimide powder which comprises: adding an inert entraining agent for water to a solution of an aromatic polyamido-acid having an intrinsic viscosity of from 1.5 to 2.5 dl/g, said polyamido-acid being dissolved in an aprotic dipolar organic solvent; heating the formed mixture to the boiling point of the entraining agent to convert the polyamido-acid to polyimide with the formation of water and to azeotropically distill off the formed water along with the entraining agent; and thereafter filtering the polyimide powder which precipitates out of the solution and drying the powder.

4,413,118
PROCESS FOR REMOVAL OF HOMOGENEOUS CATALYST GROUP VIII METALS FROM PROCESS STREAMS

F. Edward Roberts, Princeton, and Victor J. Grenda, Warren, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 2, 1981, Ser. No. 239,726

Int. Cl.³ C07H 17/08

U.S. Cl. 536—7.1 6 Claims

1. A process for removing homogenous triphenylphosphine substituted Group XIII metal catalysts selected from $RhCl(P\phi_3)_3$, $IrH_3(P\phi_3)_3$, $IrH(CO)(P\phi_3)_3$, $PdCl_2(P\phi_3)_2$, naphthyl $BrNi(P\phi_3)_2$, $Br_2Ni(P\phi_3)_2$ from toluene solvent-containing reaction process streams, which comprises adding about 2 to about 12 moles of an organic sulfur compound containing a carbon sulfur double bond selected from N-benzyl-dithiocarbamoylglycine, β-dithiocarbamylpropionic acid, thiohydantoin, thiourea, ammonium dithiocarbamate, thiobarbituric acid, thiosemicarbazide, rhodamine or 2-mercapto-4-aminopyrimidine, per mole of said Group VIII metal, warming to 50° to 100° C. for from 2 to 10 hours, cooling to 0° to 5° C. and separating the metal-organic sulfur complex that forms.

2. In a process for preparing ivermectin which comprises the steps of:

(a) hydrogenating avermectin Bla in the presence of tris-(triphenylphosphine)rhodium (I) chloride in an organic solvent selected from benzene, toluene, o-, m- or p-xylene, tetrahydrofuran and methylene chloride;

(b) evaporating the organic solvent;

(c) dissolving the residue in ethanol;

(d) treating the ethanol solution with formamide and water to cause crystallization of the product;

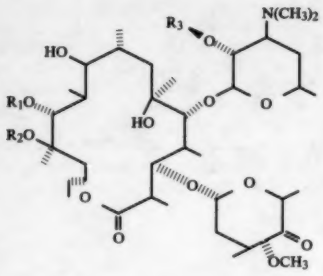
wherein the improvement comprises after the hydrogenation step (a) and before the evaporation step (b), adding about 2 to about 12 moles of an organic sulfur compound containing a carbon sulfur double bond selected from the group consisting of N-benzyldithiocarbamoylglycine, β-dithiocarbamylproprionic acid, thiohydantoin, thiourea, ammonium dithiocarbamate, thiobarbituric acid, thiosemicarbazide, rhodamine or 2-mercapto-4-aminopyrimidine, per mole of tris-(triphenylphosphine)rhodium (I) chloride; warming to 50° to 100° C. for from 2 to 10 hours; cooling to 0° to 5° C. and separating the rhodium-organic sulfur complex that forms.

4,413,119
SEMI-SYNTHETIC MACROLIDES

James R. Hauske, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 354,124, Mar. 1, 1982, Pat. No. 4,363,803. This application Apr. 26, 1982, Ser. No. 371,858
Int. Cl.³ C07H *17/08*
U.S. Cl. 536—7.2 4 Claims

1. A compound selected from the group consisting of those of the formula:



wherein R_1 and R_2 when taken separately are each hydrogen, R_1 and R_2 when taken together are $(CH_3)_2C$; and R_3 is alkanoyl having two to three carbon atoms.

4,413,120
PROCESS FOR PRODUCING ACOSAMINE, DAUNOSAMINE, 1-THIOACOSAMINE AND RELATED COMPOUNDS

Roy L. Whistler, West Lafayette, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

Filed Apr. 6, 1981, Ser. No. 251,636
Int. Cl.³ C07H *1/00*
U.S. Cl. 536—18.6 6 Claims

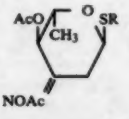
4. A process for producing L-thioacosamine derivatives which comprises:

oxidizing L-rhamnal to produce 1,5 anhydro-2,6-dideoxy-α-L-erythro-hex-1-en-3-ulose,

reacting said 1,5 anhydro-2,6-dideoxy-α-L-erythro-hex-1-en-3-ulose with an alkylthiol or salt thereof in the presence of a strong base to produce alkyl 2,6-dideoxy-1-thio-α-L-erythro-hexopyranosid-3-ulose by Michael addition,

reacting said alkyl 2,6-dideoxy-1-thio-α-L-erythro-hexopyranosid-3-ulose with hydroxylamine to introduce an oximino group at the 3-position;

reacting the resultant 3-oximino compound with acetic anhydride to produce the di-O-acetyl compound;



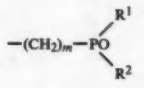
and stereospecifically reducing said di-O-acetyl compound with borane in tetrahydrofuran to convert the 3-oximino group to a 3-amido group of the arabino configuration.

4,413,121
CELLULOSE ETHERS AND CELLULOSE MIXED ETHERS HAVING AT LEAST ONE PHOSPHORUS-CONTAINING SUBSTITUENT, AND PROCESS FOR THEIR MANUFACTURE

Lothar Brandt; Arno Holst, both of Wiesbaden, and Hans-Jerg Kleiner, Kronberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,148
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112945
The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.
Int. Cl.³ C08B *11/145, 11/193*
U.S. Cl. 536—44 17 Claims

1. A cellulose ether having at least one phosphorus-containing substituent or a mixed ether of said cellulose ether having in addition at least one phosphorus-free substituent comprising alkyl, hydroxyalkyl, carboxyalkyl, sulfonalkyl, aminoalkyl, or diaminoalkyl, wherein the phosphorus-containing substituent(s) comprise(s) groups of the formula



wherein

R^1 and R^2 are OX; or R^1 is OX and R^2 is OY; or R^1 is OX and R^2 is $(CH_2)_n$-CH_3; or R^1 and R_2 are $(CH_2)_n$-CH_3; or R^1 is $(CH_2)_n$-CH_3 and R^2 is $(CH_2)_p$-CH_3, whereby

X,Y are identical or different and comprise a hydrogen atom or a monovalent cation;

m is an integer from 1 to 4; and

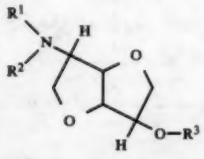
n,p are identical or different and are 0 or 1; with the proviso that when m is 1 or 2, R^1 and R^2 may not be OX and R^1 and R^2 may not be OX and OY, respectively.

4,413,122
OPTIONALLY N-SUBSTITUTED AMINODESOXY-1.4;3.6-DIANHYDROHEXITOL DERIVATIVES

Klaus Klessing, Ettlingen, Fed. Rep. of Germany, assignor to Fa. Wilmar Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 285,358
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028288
Int. Cl.³ C07D *493/04*
U.S. Cl. 544—153 20 Claims

1. Aminodesoxy-1.4;3.6-dianhydrohexitol derivatives of the general formula I,



(I)

wherein R^1 and R^2, in each case independently of one another, signifies a hydrogen atom or a lower alkyl group with 1 to 4 carbon atoms or wherein R^1 signifies a hydrogen atom and R^2 an adamant(1)yl radical or wherein R^1 and R^2, together with the nitrogen atom to which they are attached, signify the residue of a cyclic, non-aromatic secondary amine or the residue of a cyclic, non-aromatic secondary amine containing an additional hetero atom; and R^3 signifies a hydrogen atom, a

methanesulphonyl or toluene sulphonyl group, as well as their acid addition salts, with the proviso that when R^1 and R^2 are both methyl, R^3 is not toluene sulphonyl.

4,413,123

SOLUTION SYNTHESIS OF 1,3,5-TRIACRYLYLHEXAHYDRO-S-TRIAZINE

Louis B. Conte, Jr., Newark, and Walter T. Reichle, Warren, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 29, 1982, Ser. No. 363,108
Int. Cl.³ C07D *251/04*
U.S. Cl. 544—215 **12 Claims**

1. A process for producing 1,3,5-triacrylylhexahydro-s-triazine comprising reacting acrylonitrile and trioxane in contact with a catalytic amount of an acid having a Hammet activity function (H_o) in excess of about 7.3 utilizing methylene chloride as the reaction medium.

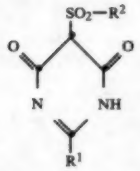
4,413,124

2-ALKYL-5-ALKYLSULFONYL-4,6-DIHALOPYRIMIDINES AND THE PRODUCTION THEREOF

Karl Hoegerle, Basel, and Kurt Ohnemus, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 329,169, Dec. 10, 1981. This application Sep. 16, 1982, Ser. No. 418,936
Claims priority, application Switzerland, Dec. 17, 1980, 9301/80
Int. Cl.³ C07D *239/54*
U.S. Cl. 544—319 **1 Claim**

1. A compound of the formula IV



(IV)

wherein each of R^1 and R^2 independently is straight chain or branched chain C_1–C_5alkyl, or a salt thereof.

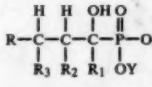
4,413,125

α-HYDROXY PHOSPHONATES

Van R. Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 1, 1981, Ser. No. 279,371
Int. Cl.³ C07F *9/40, 9/65*
U.S. Cl. 546—22 **10 Claims**

1. An α-hydroxy phosphonate compound of the formula



wherein X and Y are each independently selected from the group consisting of lower alkyl or benzyl; R_1, R_2 and R_3 are each independently selected from the group consisting of hydrogen, lower alkyl; R is a —Z—R_4 group wherein Z is oxygen or sulfur, and R_4 is lower alkyl, lower alkanol, aryl or R is piperidinyl or,

wherein —Z′ is nitrogen, and R_5 is lower alkyl, or lower alkoxyalkyllowеralkyl and R_6 is lower alkyl or hydrogen.

4,413,126

PREPARATION OF ISOQUINOLINE DERIVATIVES USEFUL AS IMMUNE REGULANTS

Jack B. Campbell, and Edward R. Lavagnino, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 9, 1982, Ser. No. 386,833
Int. Cl.³ C07D *471/06*; A61K *31/47*
U.S. Cl. 546—52 **4 Claims**

1. A method for preparing 10- or 11-trifluoromethyl-7H-benzimidazo[2,1-a]benz[de]isoquinoline-7-one which comprises:

(Step A) treating naphthalimide with a 4- or 5-trifluoromethyl-substituted o-nitrohalobenzene in an inert solvent at about 50°–200° C. in the presence of an alkali metal carbonate or hydroxide to form the intermediate N-substituted naphthalimide and

(Step B) reducing the intermediate N-substituted naphthalimide and heating in an inert solvent at about 50°–180° C.

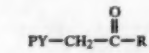
4,413,127

PREPARATION OF 1,2-DIHYDRO-6-(LOWER ALKYL)-2-OXO-5-(PYRIDINYL)NICOTINONITRILES

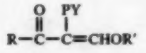
Baldev Singh, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed May 24, 1982, Ser. No. 381,062
Int. Cl.³ C07D *213/64*
U.S. Cl. 546—249 **6 Claims**

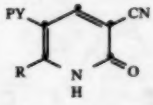
1. The process which comprises reacting pyridinylmethyl lower-alkyl ketone of the formula



with tri(lower-alkyl) orthoformate, acetic anhydride and acetic acid to produce 2-(lower-alkoxy)-1-(pyridinyl)-ethenyl lower-alkyl ketone of the formula

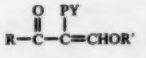


and reacting said ketone with malononitrile in a lower-alkanol to produce 1,2-dihydro-6-R-2-oxo-5-PY-nicotinonitrile of the formula

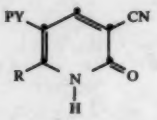


where R and R′ are each lower-alkyl and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4. The process which comprises reacting 2-(lower-alkoxy)-1-(pyridinyl)-ethenyl lower-alkyl ketone of the formula



with malononitrile to produce 1,2-dihydro-6-R-2-oxo-5-PY-nicotinonitrile of the formula



where R and R′ are each lower-alkyl and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,413,128

NITROPYRIDINE-N-OXIDE MOLECULAR CRYSTALS

Daniel S. Chemla, 50, Avenue Jean Jaures; Jean-Louis Oudar, 27, Avenue du Plessis, both of 92290 Chatenay Malabry, and Georges Tsoucaris, 13, rue Andre Theuriet, 92340 Bourg la Reine, all of France

Continuation-in-part of Ser. No. 214,989, Dec. 10, 1980, abandoned. This application May 18, 1982, Ser. No. 379,486

Int. Cl.³ C07D *213/89*

U.S. Cl. 546—312 **1 Claim**

1. A molecular crystal material comprising (1) p-nitropyridine-N-oxide substituted by at least one chiral radical in the ortho- or meta- position, wherein said chiral radical has the formula:

in which R_1, R_2 and R_3 are all different and represent H, CH_3 or $COOR_4$ wherein R_4 is H or CH_3 and C is an asymmetric carbon atom.

4,413,129

PROCESS FOR PREPARING THE H_2-RECEPTOR ANTAGONIST CIMETIDINE

Saburo Uchikuga, Yokohama; Tomoyasu Tashiro, Hatano, and Yasuko Osawa, Tokyo, all of Japan, assignors to Sogo Pharmaceutical Company, Ltd., Kanagawa, Japan

Division of Ser. No. 38,265, May 11, 1979, abandoned. This application Jan. 17, 1980, Ser. No. 113,135

Claims priority, application Japan, Dec. 27, 1978, 53-159895

Int. Cl.³ C07D *233/64*

U.S. Cl. 548—342 **2 Claims**

1. A process for preparing cimetidine comprising

reacting 4-methyl-5-hydroxymethylimidazole in the form of mineral acid salt or free base, with 2-aminoethanethiolsulfuric acid in acetic acid, to obtain 4-methyl-5-[(2-aminoethyl)thiomethyl]imidazole;

reacting said 4-methyl-5-[(2-aminoethyl)thiomethyl-]imidazole with O-alkyl-S-alkyl ester of cyanamidethiocarbonic acid to yield N-cyano-N′-[2-((4-methyl-5-imidazolyl)methylthio)ethyl]-O-alkylisourea; and

reacting said N-cyano-N′-[2-((4-methyl-5-imidazolyl)methylthio)ethyl]-O-alkylisourea with monomethylamine, and thereby obtaining cimetidine.

4,413,130

SULPHOXIDES

George R. White, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

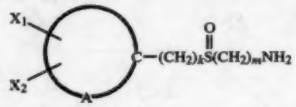
Division of Ser. No. 197,430, Oct. 16, 1980, Pat. No. 4,338,328, which is a division of Ser. No. 960,364, Nov. 13, 1978, Pat. No. 4,255,425, which is a division of Ser. No. 824,121, Aug. 12, 1977, Pat. No. 4,140,783, which is a division of Ser. No. 689,013, May 24, 1976, Pat. No. 4,056,620, which is a division of Ser. No. 627,418, Oct. 30, 1975, Pat. No. 3,979,398, which is a division of Ser. No. 436,285, Jan. 24, 1974, Pat. No. 3,932,443. This application Mar. 26, 1982, Ser. No. 362,220

Claims priority, application United Kingdom, Feb. 8, 1973, 6153/73; Oct. 23, 1973, 49257/73

Int. Cl.³ C07D *233/64*

U.S. Cl. 548—342 **2 Claims**

1. A compound of the formula:



wherein A is such that the heterocyclic nucleus formed is an imidazole ring; X_1 and X_2, which may be the same or different, are hydrogen, lower alkyl, trifluoromethyl, hydroxyl, halogen, or amino; k is 0 to 2 and m is 2 or 3 provided that the sum of k and m is 3 or 4.

4,413,131

4,5,6,7-TETRAHALO-ISOINDOLIN-1-ONE DERIVATIVES

Dimitrios Karanatsios, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

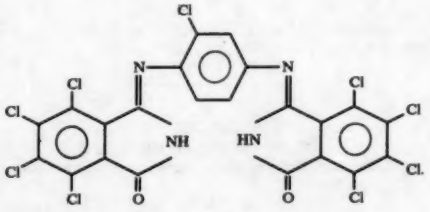
Filed Jul. 11, 1977, Ser. No. 814,559

Claims priority, application Switzerland, Jul. 16, 1976, 9135; Oct. 20, 1976, 13256

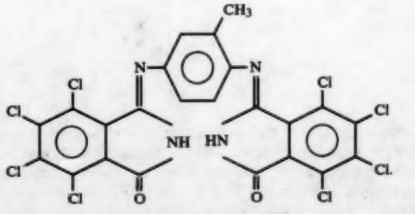
Int. Cl.³ C07D *209/50*

U.S. Cl. 548—461 **3 Claims**

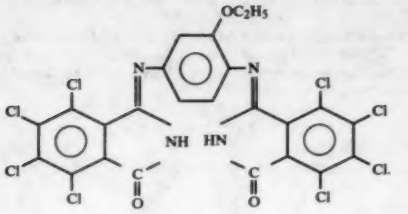
1. A compound of the formula



2. A compound of the formula



3. A compound of the formula



4,413,132

ANTIBIOTIC CC-1065 INDOLINE INTERMEDIATES

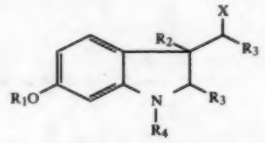
Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 207,838, Nov. 18, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,463

Int. Cl.³ C07D *209/12*

U.S. Cl. 548—491 2 Claims

1. A compound of the formula



wherein R_1 is selected from the group consisting of CH_3, $-CH_2Ph$, $CH_2{=}CHCH_2-$, $-CH_2SCH_3$, $-CH_2OCH_3$, $CH_2OCH_2CH_2OCH_3$, $-CH_2CCl_3$, and $-CH_2CH_2Si(R_2)_3$; R_2 and R_3 are H, alkyl of from 1 to 5 carbon atoms, inclusive, and phenyl; R_4 is selected from the group consisting of SO_2R_2, SO_2CH_2CO phenyl, CO_2CH_2Z where Z is selected from the group consisting of CH_2I, CCl_3, $CH_2SO_2R_2$, Ph (phenyl), and fluoroenylmethyl, and X is selected from the group consisting of OSO_2R_2, Cl, Br, and I.

4,413,133

PROCESS FOR MANUFACTURING CHLOROLACTONES FROM UNSATURATED CARBOXYLIC ACIDS

Bernard Damin, Oullins; Alain Forestiere, Vernaison, and Bernard Sillion, Rocquencourt, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

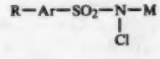
Filed Nov. 13, 1981, Ser. No. 321,145

Claims priority, application France, Nov. 14, 1980, 80 24393

Int. Cl.³ C07D *307/32*

U.S. Cl. 549—265 9 Claims

1. A selective, one-step process for manufacturing chlorolactones by chlorolactonization of unsaturated carboxylic acids, comprising reacting, in an anhydrous organic solvent, a metal N-chlorosulfonamidate of the general formula:



wherein R is a hydrogen atom, an alkyl radical or a halogen atom; Ar is a divalent aromatic radical containing one or more rings; and M is an alkali metal, with an aliphatic or alicyclic carboxylic acid having at least one ethylenic unsaturation separated from the carboxyl group by at least two carbon atoms, in the presence of a strong acid whose conjugate base is weakly nucleophilic.

4,413,134

TRIACYLATED DERIVATIVE OF SCIRPENTRIOL

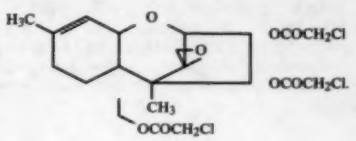
Henry Schmitz, Syracuse; Takushi Kaneko, Fayetteville; John M. Essery, Pleasantville, and Terrence W. Doyle, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 240,340, Mar. 4, 1981, Pat. No. 4,332,732, which is a division of Ser. No. 137,336, Apr. 4, 1980, Pat. No. 4,284,568. This application Jan. 15, 1982, Ser. No. 339,581

Int. Cl.³ C07D *311/78*

U.S. Cl. 549—332 1 Claim

1. The compound having the formula



4,413,135

INTERMEDIATES IN THE PREPARATION OF RANITIDINE

John W. Clitherow, Hertfordshire, England, assignor to Glaxo Group Limited, London, England

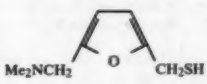
Division of Ser. No. 223,484, Jan. 8, 1981, abandoned. This application Jun. 4, 1982, Ser. No. 385,075

Claims priority, application United Kingdom, Jan. 8, 1980, 8000581; Aug. 12, 1980, 8038336

Int. Cl.³ C07D *307/52, 307/54*

U.S. Cl. 549—495 2 Claims

1. The thiol of formula (II)



(II)

in the form of a stable acid addition salt.

2. The isothiourea of formula (IV)

(IV)

and stable acid addition salts thereof.

4,413,136

PURIFICATION OF TETRAHYDROFURAN

Richard E. Ernst, Kennett Square, Pa., and Harry B. Copelin, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 2, 1982, Ser. No. 404,374

Int. Cl.³ C07D *307/08*

U.S. Cl. 549—509 5 Claims

1. In the multi-stage refining of tetrahydrofuran made from acetylene and formaldehyde, a method of reducing the content of methacrolein impurity, which method comprises treating the tetrahydrofuran before any of the distillation stages with hydrogen peroxide in about the same weight as the methacrolein to be destroyed and from 10 to 100 milliequivalents excess of base at a temperature of from 20° to 65° C., and then separat-

ing tetrahydrofuran and the resulting chemically modified impurity.

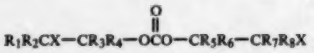
4,413,137

PROCESS FOR MAKING VICINAL EPOXIDES

James M. Renga, Midland, Mich., and Roy A. Periana-Pillai, Berkeley, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 21, 1982, Ser. No. 390,438
Int. Cl.³ C07D *301/02;* **C07C** *17/33, 19/045*
U.S. Cl. 549—518 **10 Claims**

1. A process for making a vicinal epoxide and an alkylene dihalide which comprises contacting a mixture comprising ethylene carbonate and a β-haloalkyl carbonate corresponding to the formula:



with an initiator at a temperature from about 25° C. to about 260° C., wherein:

each R_1–R_8 independently is hydrogen, a hydrocarbon group of up to about 20 carbons, $—CH_2X$ or $—CH_2Y$, where Y is an alkoxy group of up to 10 carbons or an aroxy group of up to about 20 carbons; and

X is chloro or bromo.

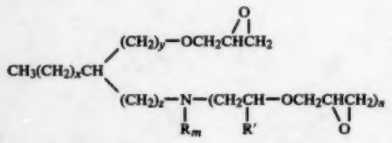
4,413,138

GLYCIDYL ETHERS OF AMINOPOLYOLS

Elizabeth J. Gladfelter, St. Paul, and Edgar R. Rogier, Minnetonka, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

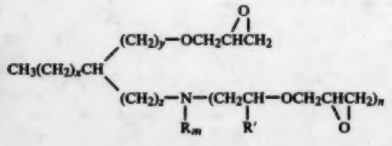
Filed Nov. 16, 1981, Ser. No. 321,969
Int. Cl.³ C07D *303/36, 303/27*
U.S. Cl. 549—551 **4 Claims**

1. The glycidyl ethers of a tertiary amino polyol of the following structure:



and mixtures thereof; wherein x is 7(8); y is 9(8); z is 1; n is 2; m is 0; and R′ is H.

3. The glycidyl ethers of a tertiary amino polyol of the following structure:



and mixtures thereof; where x is 7(8); y is 1; z is 9(8); n is 2; m is 0; and R′ is H.

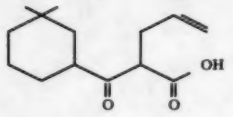
4,413,139

INTERMEDIATES USED IN THE PROCESS FOR PREPARING 1(4-PENTENOYL)-3,3-DIMETHYLCYCLOHEXANE

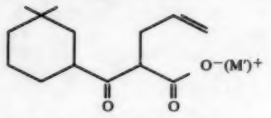
John B. Hall, Rumson, and Mark A. Sprecker, Sea Bright, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 6, 1982, Ser. No. 375,767
Int. Cl.³ C07C *59/80, 69/73*
U.S. Cl. 560—126 **5 Claims**

1. The compound defined according to the structure:

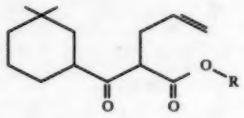


2. The compound defined according to the structure:



wherein M′ represents alkali metal.

4. The compound defined according to the structure:



wherein R represents C_1–C_3 lower alkyl.

4,413,140

LIQUID EXTRACTION OF DIACETOXYBUTANE WITH HALOGENATED PARAFFINS

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 26, 1977, Ser. No. 791,106
Int. Cl.³ C07C *67/58, 69/15, 27/02, 27/34, 51/48, 53/08*
U.S. Cl. 560—248 **6 Claims**

1. A process for separating 1,4-diacetoxybutane from a mixture comprising 1,4-diacetoxybutane, 4-acetoxy-1-butanol, 1,4-butanediol, acetic acid, and water, which comprises the steps of:

(a) contacting said mixture in a liquid extraction zone with at least one solvent selected from halogenated paraffins having normal boiling points below about 392° F. under conditions which produce an extract containing 1,4-diacetoxybutane and solvent and a raffinate containing water, 1,4-butanediol, acetic acid, and 4-acetoxy-1-butanol;

(b) withdrawing from the liquid extraction zone said extract and said raffinate; and

(c) separating said withdrawn extract into solvent and 1,4-diacetoxybutane.

4,413,141
2-(DIFLUOROMETHYL)-2,5-DIAMINOPENTANOIC ACID

Philippe Bey, Strasbourg, and Michel Jung, Illkirch-Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Continuation-in-part of Ser. No. 53,937, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 814,765, Jul. 11, 1977, abandoned. This application Sep. 17, 1982, Ser. No. 419,347

Int. Cl.³ C07C *101/24*

U.S. Cl. 562—561 **3 Claims**

1. 2-Difluoromethyl-2,5-diaminopentanoic acid, or a pharmaceutically acceptable salt thereof.

4,413,142
METHOD FOR PREPARING L-CARNITINE

Mario Fiorini, and Claudio Valentini, both of Rome, Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Mar. 15, 1982, Ser. No. 358,326

Claims priority, application Italy, Mar. 18, 1981, 20396 A/81

Int. Cl.³ C07C *101/30*

U.S. Cl. 562—567 **44 Claims**

1. A process for the preparation of L-carnitine starting from D-mannitol comprising the steps of reacting D-mannitol with a ketone, subjecting the thusly obtained D-mannitol diketonide to an oxidative splitting reaction to obtain a glyceraldehyde ketonide, treating the latter compound with a reducing agent of the aldehyde class, substituting the alcoholic group of the glycerol acetonide thus obtained by a halogen atom, subjecting the halogenated derivative to acidic hydrolysis to obtain the halogenated dihydroxypropane, esterifying the primary alcoholic group of the latter compound with the acid chloride of a sulphonic acid, reacting said ester with a salt of hydrogen cyanide to obtain the corresponding nitrile, treating said nitrile with trimethylamine so as to obtain the carnitinonitrile, subjecting the nitrile group thereof to acidic hydrolysis to build up the corresponding carboxyl group, effecting an ion-exchange between the halide ion of the L-carnitine acid halide and a hydroxyl ion and separating the thusly obtained L-carnitine.

4,413,143
METHOD OF PRODUCING ACRYLAMIDE FROM WATER-IN-OIL EMULSION OF ACRYLONITRILE

Kenneth G. Phillips, River Forest, and John G. Premo, Western Springs, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 213,278, Dec. 5, 1980, which is a continuation of Ser. No. 89,817, Oct. 31, 1979, abandoned. This application Dec. 9, 1981, Ser. No. 329,011

Int. Cl.³ C07C *102/08*

U.S. Cl. 564—128 **5 Claims**

1. A method of producing acrylamide from acrylonitrile in the presence of a metallic conversion catalyst which comprises contacting a water-in-oil emulsion of acrylonitrile which is contained in the dispersed aqueous phase of the emulsion under conditions whereby a substantial portion of the acrylonitrile is converted to acrylamide which remains in the aqueous phase of the emulsion.

4,413,144
4-ISOPROPYL-4'-NITROBENZOPHENONE AND A PROCESS FOR THE PREPARATION OF 4'-NITROBENZOPHENONES SUBSTITUTED IN THE 4-POSITION

Horst Tappe, Dietzenbach, and Herbert Wille, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 362,977

Claims priority, application Fed. Rep. of Germany, May 25, 1981, 3120747

Int. Cl.³ C07C *49/786*

U.S. Cl. 568—306 **1 Claim**

1. 4-Isopropyl-4'-nitrobenzophenone.

4,413,145
PROCESS FOR THE SYNTHESIS OF 3-KETO-CYCLOPENTENE-5-OXY DERIVATIVES HAVING INSECTICIDE ACTIVITY

Giovanni Piancatelli; Arrigo Scettri, and D'Auria Maurizio, all of Rome, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

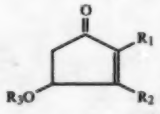
Filed Jul. 28, 1981, Ser. No. 287,667

Claims priority, application Italy, Feb. 11, 1981, 47769 A/81

Int. Cl.³ C07C *45/45*; C07G *13/00*

U.S. Cl. 568—345 **20 Claims**

1. A process for the synthesis of the 3-keto-cyclopentene-5-oxy derivatives (rethrolones) with general formula:



(I)

wherein:

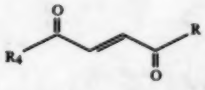
R_1 = Hydrogen, saturated or unsaturated C_1–C_{10} alkyl

R_2 = Saturated or unsaturated C_1–C_{10} alkyl

R_3 = Hydrogen

having insecticide activity characterized by the operations of:

(a) Photoisomerizing by artificial illumination in polar and non polar solvents a trans-enedicarbonylic intermediate with general formula:



(II)

wherein:

R = C_4–C_{10} alkyl and

R_4 = R_2

to the cis-enedicarbonylic compound with formula

(III)

(b) Cyclizing the (III) compound to the corresponding rethrolone of formula (I) by treatment with organic or inorganic bases in solvents constituted of water and an aprotic dipolar solvent at temperature of 20°–100° C.

4,413,146
TRANSITION METAL CARBONYL COMPLEXES INTERCALATED WITH LAMELLAR MATERIALS AND USE OF THE INTERCALATED COMPLEXES IN THE CATALYSIS OF ORGANIC REACTIONS

James A. Hinnenkamp, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 207,166, Nov. 17, 1980, Pat. No. 4,324,695. This application Nov. 25, 1981, Ser. No. 325,179

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—451 **6 Claims**

1. In the catalyzed hydroformylation reaction of, propylene, hydrogen and carbon monoxide under hydroformylation conditions to provide n-butyraldehyde and/or isobutyraldehyde, the improvement which comprises using as catalyst an intercalate composition comprising graphite intercalated with transition metal, said transition metal being present substantially as transition metal carbonyl.

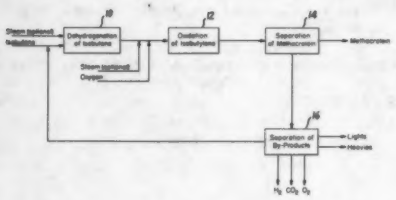
4,413,147
CONVERSION OF ISOBUTANE TO METHACROLEIN

Sargis Khoobiar, Kinnelon, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Apr. 14, 1982, Ser. No. 368,196

Int. Cl.³ C07C *45/35*

U.S. Cl. 568—476 **14 Claims**



1. A process for the preparation of methacrolein from isobutane comprising:

(a) dehydrogenating isobutane to isobutylene, optionally in the presence of steam, over a dehydrogenation catalyst comprising a Group VIII noble metal or base metal oxide on a support at a temperature in the range of about 300°-700° C. and up to about 10 kg/cm² gauge pressure to form an effluent stream comprising isobutylene, hydrogen, carbon oxides and unreacted isobutane;

(b) mixing oxygen and optionally steam with said effluent stream of (a) and passing the mixture over a molybdenum-based oxidation catalyst at conditions selected to produce methacrolein and producing an effluent stream comprising methacrolein, unreacted isobutylene and isobutane, and oxygen, and carbon oxides;

(c) recovering the methacrolein from said effluent of (b).

4,413,148
PROCESS FOR PRODUCING DICUMYLPEROXIDE

Mitsukuni Kato; Takuya Demachi; Hidehiko Hagii, and Takeshi Arai, all of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 349,413

Claims priority, application Japan, Feb. 19, 1981, 56-23526

Int. Cl.³ C07C *179/035, 179/06*

U.S. Cl. 568—578 **6 Claims**

1. In a process for producing dicumyl peroxide by reacting cumene hydroperoxide and α,α-dimethyl benzyl alcohol, in the presence of an acid catalyst, while continuously removing water which is formed in the reaction system therefrom, the improvement which comprises: the reaction is carried out at a temperature in the range of 30° to 80° C., in the presence of one or more polar solvents which are selected from the group consisting of hexamethyl phosphoramide, 1,3-dimethyl-2-imidazolidinone and compounds having the following formulae (I), (II), (III), and (IV):

$$R_2O\text{-}(\text{-}CHCH_2O\text{-})_n\text{-}R_3 \quad \text{(I)}$$
(with R_1 on the CH)

wherein R_1 is hydrogen or methyl, R_2 and R_3 each is hydrogen, alkyl having 1 to 4 carbon atoms, or phenyl, and n is an integer of from 1 to 10;

$$(R_4O)_3P{=}O \quad \text{(II)}$$

wherein R_4 is alkyl having 1 to 4 carbon atoms or phenyl;

$$(R_5)_2S{=}O \quad \text{(III)}$$

wherein R_5 is alkyl having 1 to 4 carbon atoms, phenyl or benzyl; and

$$(CH_3)_2N\text{-}\overset{\overset{O}{\|}}{C}\text{-}R_6 \quad \text{(IV)}$$

wherein R_6 is hydrogen or methyl; and said acid catalyst is selected from the group consisting of sulfuric acid, hydrochloric acid, perchloric acid, p-toluene sulfonic acid and trichloroacetic acid.

4,413,149
PROCESS FOR THE CATALYTIC HYDROGENOLYSIS OF P-SUBSTITUTED BENZALDEHYDE-DIMETHYLACETALS TO PRODUCE THE CORRESPONDING BENZYL METHYL ETHER DERIVATIVES

Hartmut Fischer, Hofheim, and Detlef H. Skaletz, Mainz, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 333,012

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048993

Int. Cl.³ C07C *43/205, 41/28*

U.S. Cl. 568—636 **5 Claims**

1. A process for the catalytic hydrogenolysis of p-substituted benzaldehyde-dialkylacetals to produce the corresponding p-substituted benzyl alkyl ether derivatives, comprising the step of:

hydrogenolyzing a p-substituted benzaldehyde-dialkylacetal compound selected from the group consisting of 4-methoxy-benzaldehyde-dimethylacetal, 4-phenoxy-benzaldehyde-dimethylacetal, and 4,4'-diphenyl ether-dialdehydebis-dimethylacetal, in the presence of a catalyst system comprising a cobalt carbonyl and at least one heterocyclic compound containing at least one heterocyclic nitrogen atom selected from the group consisting of pyridine, pyrrole, pyrrolidone and piperidine.

4,413,150
TWO PRODUCT PROCESS FOR METHYL TERTIARY BUTYL ETHER PRODUCTION

Bruce A. Briggs, Wheeling, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 18, 1981, Ser. No. 332,381

Int. Cl.³ C07C *41/05*

U.S. Cl. 568—697 **9 Claims**

1. A hydrocarbon conversion process which comprises the steps of:

(a) reacting isobutylene with a C_1 to C_3 aliphatic alcohol in an etherification zone and producing an etherification zone effluent stream which comprises C_4 hydrocarbons, unconverted alcohol and a reaction product ether;

(b) separating the entire etherification zone effluent stream

in a single fractionation column into a net overhead stream comprising C_4 hydrocarbons, the unconverted alcohol and a portion of the reaction product ether and a net bottoms stream comprising the remainder of the reaction product ether and which is substantially free of the alcohol;

(c) passing between about 70 to 90 weight percent of said net overhead stream into the etherification zone;

(d) admixing between 5 to 40 weight percent of said net overhead stream with a first portion of said net bottoms stream to form a first product stream; and,

(e) removing a second portion of said net bottoms stream as a second product stream.

4,413,151

PROCESS FOR HYDROXYLATING OLEFINS USING A SUPPORTED OSMIUM CATALYST

Robert C. Michaelson, Waldwick; Richard G. Austin, and Donald A. White, both of Ridgewood, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 14, 1982, Ser. No. 397,997

Int. Cl.³ C07C *29/03, 31/20*

U.S. Cl. 568—860 **51 Claims**

1. A process for hydroxylating olefins which comprises reacting in admixture at least one olefinic compound having at least one ethylenic unsaturation, with water and an oxidant selected from the group consisting of organic hydroperoxide, H_2O_2, and oxygen, in the presence of a catalyst composition under conditions and in a manner sufficient to convert at least one of said ethylenic unsaturation to its corresponding diol, said catalyst composition comprising:

(a) at least one osmium compound adsorbed on at least one support to form a supported osmium catalyst, said osmium compound being capable of catalyzing said hydroxylation reaction when adsorbed on said support, said supported osmium catalyst being insoluble in said admixture under hydroxylation reaction conditions; and optionally

(b) at least one co-catalyst capable of increasing at least one of the rate and selectivity of the hydroxylation reaction to product diol relative to the rate and selectivity in the absence of said co-catalyst.

4,413,152

HYDROGENATION IN AQUEOUS SOLUTIONS

Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1982, Ser. No. 411,156

Int. Cl.³ C07C *31/26, 31/24, 31/18*

U.S. Cl. 568—863 **11 Claims**

1. A method for the hydrogenation of a carbohydrate to its polyol(s) comprising at hydrogenation conditions an aqueous solution of the carbohydrate with hydrogen and a catalyst consisting essentially of a zerovalent Group VIII metal selected from the group consisting of osmium, rhodium, ruthenium, nickel, palladium and platinum dispersed on titanated alumina, and recovering the formed polyol(s).

4,413,153

INTEGRATED PROCESS FOR MAKING TRANSPORTATION FUELS AND LUBES FROM WET NATURAL GAS

William E. Garwood, Haddonfield, and Wooyoung Lee, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 22, 1982, Ser. No. 436,158

Int. Cl.³ C07C *1/04*

U.S. Cl. 585—304 **10 Claims**

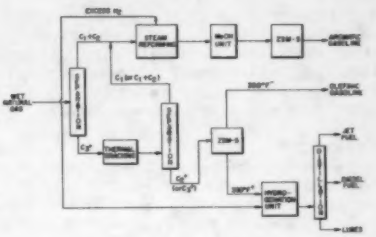
10. A process for making heavier hydrocarbon products from wet natural gas comprising the steps of:

separating wet natural gas into a dry gas fraction consisting essentially of methane and ethane and a C_3^+ paraffin rich fraction;

converting the dry gas fraction to a synthesis gas comprising carbon monoxide and hydrogen;

cracking the C_3^+ fraction to yield an olefinic product comprising a C_3^+ olefinic fraction and a C_1/C_2 hydrocarbon fraction;

separating at least a portion of the C_1/C_2 hydrocarbon fraction and mixing same with the dry gas fraction for conversion to synthesis gas;



contacting at least a portion of the C_3^+ olefinic fraction with ZSM-5 type catalyst for conversion of C_3^+ olefin to heavier hydrocarbons comprising olefinic gasoline and distillate hydrocarbons;

hydrogenating heavier distillate hydrocarbons with a fraction of hydrogen from the synthesis gas; and

converting synthesis gas to gasoline hydrocarbons.

4,413,154

DIELS-ALDER CYCLODIMERIZATION OVER A CARBON MOLECULAR SIEVE CATALYST

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,774

Int. Cl.³ C07C *3/035, 3/10*

U.S. Cl. 585—366 **4 Claims**

1. A process for cyclodimerization of a conjugated alkadiene which comprises contacting a conjugated alkadiene-containing feedstock with a large-pore carbon molecular sieve.

4,413,155

AMMOXIDATION OF OLEFINS WITH NOVEL ANTIMONATE CATALYSTS

Dev D. Suresh, Macedonia; Robert K. Grasselli, Chagrin Falls, and David A. Orndoff, Windsor, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Continuation of Ser. No. 108,326, Dec. 31, 1979, abandoned, which is a division of Ser. No. 57,853, Jul. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 862,268, Dec. 20, 1977, abandoned. This application Mar. 30, 1981, Ser. No. 249,034

Int. Cl.³ C07C *11/12*

U.S. Cl. 585—417 **5 Claims**

1. In an oxydehydrogenation process wherein an olefin having four or more contiguous carbon atoms and oxygen are contacted at elevated temperature in the vapor phase with a catalyst, the improvement wherein said catalyst is free of uranium and tellurium and defined by the following general formula:

$$Fe_{1\text{-}50}Bi_{0.1\text{-}20}Sb_{1.12\text{-}100}A_aB_bC_cO_x$$

wherein

A is at least Cu and optionally Ce, V, Cr and/or Mn;

B is earth alkali, Co, Ni, Zn, Cd, rare earth metal other than Ce, Ga, In, Tl and/or Th;

C is Mo, W, Nb, Ta, Sn, Ge, Ti, Zr, P, B and/or As; and wherein

a is 0.01 to 20;

b is 0 to 20;
c is 0.01 to 20;
x is a number determined by the oxygen requirements of the other elements present; and
wherein the amount of Sb in said catalysts on an atomic basis is greater than the sum of the amounts of all other elements in said catalyst excluding oxygen.

4,413,156

MANUFACTURE OF SYNTHETIC LUBRICANT ADDITIVES FROM LOW MOLECULAR WEIGHT OLEFINS USING BORON TRIFLUORIDE CATALYSTS

Lewis W. Watts, Jr., and Edward T. Marquis, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,742
Int. Cl.[3] **C07C** *5/00*
U.S. Cl. 585—254 **17 Claims**

1. A process for converting C_3–C_4 linear olefins to a synthetic lubricant component comprising

a. isomerizing a linear olefin feedstock selected from the group of olefins consisting of propylene, butene-1, butene-2 and mixtures thereof, over a heterogeneous isomerization catalyst selected from the group of catalysts consisting of cobalt oxide, iron oxide and manganese oxide, each of which is supported on alumina, and sodium and potassium carbonate supported on gamma alumina, at a temperature of about 70° C.,

b. disproportionating the mixture resulting from the isomerization step by passing the mixture over a heterogeneous disproportionation catalyst selected from the group of catalysts consisting of molybdenum, tungsten and rhenium, each of which is supported on alumina, and a mixture of molybdenum and cobalt supported on alumina, at a temperature in the range of about 100° to 175° C. and at a pressure of greater than 200 psig,

c. separating from the mixture resulting from the disproportionation step a mixture of olefins having carbon numbers ranging from 9 to 24, and being comprised of 99 weight percent or more internal olefins,

d. oligomerizing the mixture of internal olefins separated in the previous step by contacting the mixture with a catalyst comprising boron trifluoride and a protonic promoter being selected from the group of promoters consisting of alcohols, carboxylic acids and water, at a temperature between about 25° and about 150° C.,

e. mildly stripping off any unreacted olefin monomers from the mixture of oligomerized olefins resulting from the oligomerization step, and

f. hydrogenating the oligomerized olefins from the previous step in the presence of hydrogen and a hydrogenation catalyst to produce a synthetic lubricant component.

4,413,157

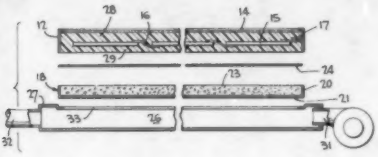
HYBRID PHOTOVOLTAIC-THERMAL DEVICE

Douglas A. Ames, 1301 20th St., NW., Washington, D.C. 20036

Continuation-in-part of Ser. No. 242,101, Mar. 9, 1981, Pat. No. 4,389,533. This application Jun. 24, 1981, Ser. No. 276,824

Int. Cl.³ H01L *31/04;* F24J *3/02*

U.S. Cl. 136—248 9 Claims



1. A photovoltaic device for transforming light energy into usable electrical energy, comprising

(a) a solar panel having side walls forming an enclosure with an upper portion adapted to receive light therethrough, and a lower portion;

(b) photovoltaic cells positioned in said enclosure beneath said upper portion and above said lower portion of said enclosure, said cells being enclosed in and supported and protected by an encapsulant and having light-receiving, upwardly facing surfaces and electrical contacts for collecting and channeling electrical energy generated by said cells to perform work;

(c) said lower portion of said enclosure being free of any materials that substantially inhibit the passage of heat therethrough so that heat also generated during operation of said cells passes beneath said cells and into said lower portion of said enclosure, and

(d) a container housing salt hydrate materials that are solid at ambient temperatures of use of said solar panel and can be melted by the heat generated during operation of said photovoltaic cells,

(e) said container being positioned in proximity to said lower portion of said enclosure so that heat generated during the operation of said photovoltaic cells will pass freely to and through said lower portion of said enclosure and melt said salt hydrate materials, thereby effectively storing heat in said materials and lowering the operating temperature of said photovoltaic cells with minimal inhibition from the structure of said solar panel.

4,413,158

AUTOMATIC CALL FORWARDING TELEPHONE APPARATUS

Glenn S. Danford, 329 NW. 21st St., Oklahoma City, Okla. 73103

Filed May 13, 1982, Ser. No. 377,628

Int. Cl.³ H04M *1/26*

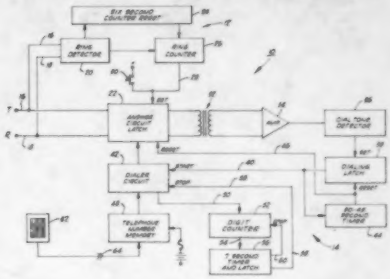
U.S. Cl. 179—90 BD 13 Claims

1. Telephone apparatus for connection to a subscriber line for a subscriber station, comprising:

means programmable to contain an electronic switching system call forwarding access code and designated station telephone number and energizable to dial out on said subscriber line to effect call forwarding of subsequent calls to said designated station;

switch means actuatable to energize said means programmable to effect call forwarding of said subsequent calls; and

circuit means responsive to detection of an incoming call unanswered for a pre-set duration for alteranative operation to energize said means programmable to effect call



forwarding of said subsequent calls when said switch means is unactuated.

4,413,159

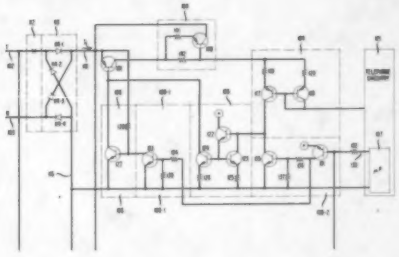
DIAL PULSING CIRCUIT

Donald D. Huizinga; Donald R. Means, both of Indianapolis, and Edward W. Underhill, Knightstown, all of Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1982, Ser. No. 364,752

Int. Cl.³ H04M *1/31*

U.S. Cl. 179—90 K 13 Claims



1. A dial pulsing circuit for converting a pulse train representing a dialed digit into corresponding interruptions of the line current on a telephone line comprising in combination, a pulsing transistor, means for connecting said pulsing transistor in series with said telephone line, pulsing means for turning said pulsing transistor ON and OFF in response to said pulse train, an adjustable current source connected to said pulsing transistor for biasing said transistor in the conductive ON state, and means for adjusting said current source in response to the magnitude of the line current on said telephone line.

4,413,160

RIBBON-TYPE LOUDSPEAKER

Takashi Ohyaba, and Yoichi Suzuki, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,244

Claims priority, application Japan, Mar. 10, 1981, 56-32226[U]

Int. Cl.³ H04R *11/00*

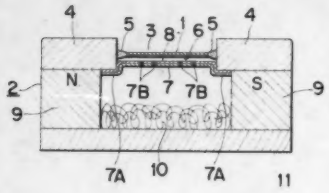
U.S. Cl. 179—115 V 7 Claims

1. A ribbon-type loudspeaker comprising

magnet means;

an electrically conductive diaphragm provided within said

magnet means to complete a magnetic circuit, said diaphragm forming an electric circuit transversely of said magnetic circuit, at least one side of said diaphragm being formed with an electrically insulating layer; and



a heat absorbing plate extended within said magnet means and attached in contacting relation thereto over an extended area, said heat absorbing plate being formed with an electrically insulating layer in facing relation to the electrically insulating layer of the diaphragm.

4,413,161

ELECTRO-ACOUSTIC TRANSDUCER

Toyosaku Matsumoto, and Takao Nakaya, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 4, 1981, Ser. No. 231,296

Claims priority, application Japan, Feb. 9, 1980, 55-15303[U]; Feb. 9, 1980, 55-15304[U]

Int. Cl.³ H04R *9/02*

U.S. Cl. 179—115.5 PV **20 Claims**

1. An electro-acoustic transducer, comprising:

a diaphragm made of a non-magnetizable, non-electroconductive flexible planar material having a vibratable portion and a stationary portion;

a continuous circular coil made of electrically conductive material formed on a surface of said diaphragm and having a plurality of turns, wherein at least one half of each turn is circular and concentric with the other turns; and

a magnet plate having a pair of opposite magnetic poles formed on its surface with a pattern corresponding in its entirety to the pattern of said coil,

said opposite magnetic poles being disposed alternately in radial direction of said magnet plate while forming transitional zones between adjacent opposite magnetic poles,

said magnet plate being positioned with respect to the diaphragm so that said transitional zones are confronted by respective turns of the coil,

said stationary portion of the diaphragm being fixed relative to said magnet plate.

4,413,162

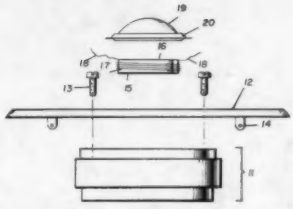
MOVING COIL TRANSDUCERS USING MULTIPLE-STRANDED COILS

Stuart W. Lumsden, and Matthew S. Polk, both of Baltimore, Md., assignors to Polk Audio, Inc., Baltimore, Md.

Filed May 28, 1982, Ser. No. 383,233

Int. Cl.³ H04R *9/00, 9/04*

U.S. Cl. 179—115.5 VC **2 Claims**



1. A moving coil transducer including a rigid mounting structure and a stationary magnetic structure, a moving coil structure mounted on said rigid mounting structure, said moving coil structure having a diaphragm means adapted to move with respect to said mounting structure and stationary magnetic structure in response to electrical signals within said coil structure whereby the moving coil transducer functions as a loudspeaker, said coil structure comprising at least one turn of wire, said wire extending from the coil in leads having first and second ends, said wire comprising a stranded wire having a plurality of individual conductors, said rigid mounting structure having terminal means thereon, said wire leads extending continuously from the coil structure through apertures in said diaphragm means to said terminal means, said wire being twisted to a predetermined lay within a range from and including $\frac{1}{4}$ inch to and including $\frac{1}{2}$ inch throughout its length.

4,413,163

PORTABLE LINE TESTER FOR TELECOMMUNICATION SYSTEM

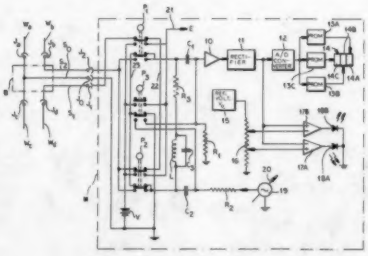
Bruno Basini, Rome, Italy, assignor to Selenia, Industrie Elettroniche Associate, S.p.A., Rome, Italy

Filed Dec. 23, 1981, Ser. No. 334,066

Claims priority, application Italy, Jan. 6, 1981, 47520 A/81

Int. Cl.³ H04B *3/46*

U.S. Cl. 179—175.3 R **10 Claims**



1. A portable metering unit for testing a subscriber line of a telecommunication system while having one input terminal connected to a first line conductor and two other input terminals respectively connected to a second line conductor and to one wire of a service telephone also having another wire joined to said one line conductor, comprising:

a first and a second switch having contacts serially connected across said two other input terminals for normally

completing a calling circuit between said second line conductor and said one wire of said service telephone enabling extension of said line to a remote station;

level-measuring means connectable to said second line conductor via a first capacitor in series with other contacts of said first switch in an actuated position of the latter for registering the attenuation of an incoming pilot tone generated at the remote station;

an oscillator connectable to said second line conductor via a second capacitor in series with other contacts of said second switch in an actuated position of the latter for emitting a locally generated pilot tone to the remote station; and

circuit means including an impedance path extending ahead of said capacitors between said other contacts of said first and second switches for closing a resistive loop across said line conductors by way of said one input terminal in the actuated position of either of said switches.

4,413,164

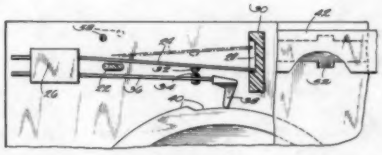
TIMER WITH MANUAL MEANS FOR DISABLING A SWITCH

George Obermann, Niles, and Edward J. Mateja, Hillside, both of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Apr. 22, 1982, Ser. No. 370,721

Int. Cl.³ H01H *43/10*

U.S. Cl. 200—38 R **11 Claims**



1. A timer having a rotatable program cam drum journaled in a frame for rotation about an axis and provided with a plurality of cam track operating switches, each switch including a passive blade and an active blade actuated by a cam track to engage the associated passive blade as required by the cam track as the drum is rotated, and

manually operable means engageable with said passive blade and mounted in the frame for rotational movement between an enabling position in which said means does not engage said passive blade and a disabling position in which said means engages and moves said passive blade to a position in which it cannot be contacted by said active blade when the active blade is actuated by the cam track.

4,413,165

OUTDOOR HIGH VOLTAGE CIRCUIT BREAKER

Thomas Schultz, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

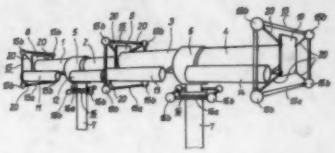
Filed Mar. 12, 1981, Ser. No. 242,910

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009993

Int. Cl.³ H01H *33/24*

U.S. Cl. 200—148 H **11 Claims**

1. In an outdoor high voltage circuit breaker containing parts carrying said high voltage and shielding electrodes for preventing spraying or corona discharges in the area of said parts, the improvement comprising shielding electrodes in the form of angular frames, each of said frames being formed of



hollow cylindrical rods and of substantially spherical corner pieces, said corner pieces interconnecting said rods.

4,413,166

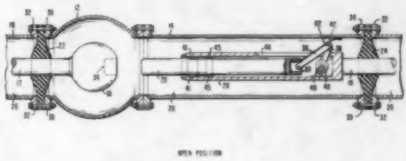
DISCONNECT SWITCH

Jeffry R. Meyer, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 19, 1981, Ser. No. 245,489

Int. Cl.³ H01H *33/60*

U.S. Cl. 200—148 B **9 Claims**



1. A gas insulated disconnect switch, comprising:

a sealed electrically grounded chamber having an insulating gas contained therein;

a pair of electrical conductors each entering from an end of said chamber;

insulating support means for preventing said conductors from contacting said chamber;

a fixed contact member, electrically attached to the first of said pair of electrical conductors in said chamber;

a movable contact member in said chamber, said movable contact member being electrically attached to the second of said pair of electrical conductors;

movement means in said chamber for displacing said movable member so as to make and break contact with said fixed member; and

grounding means electrically attached to said movable member so as to make electrical contact with said ground chamber shortly after the breaking of contact between said contact members.

4,413,167

MICPOWAVE EGG COOKER

Thomas J. Martel, North Reading, and Robert F. Bowen, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 11, 1982, Ser. No. 338,692

Int. Cl.³ H05B *6/64*

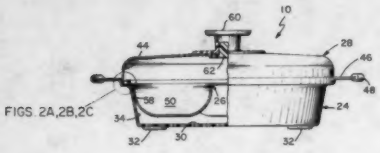
U.S. Cl. 219—10.55 E **15 Claims**

1. A utensil for steam cooking in a microwave oven, comprising:

a microwave transparent container for holding water, said container having a side wall with an outwardly extending lip at the top;

a microwave reflective tray for supporting food to be cooked, said tray being removably supported by said lip, said tray having a substantially horizontal peripheral flange, the outer perimeter edge of said flange being spaced above said lip; and

a microwave reflective lid removably supported by said lip of said container, said outer perimeter edge of said flange



FIGS. 2A,2B,2C

being spaced from the inner surface of said lid by a gap of less than 0.5 inches.

4,413,168

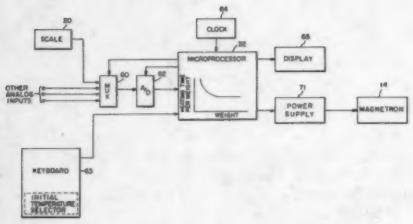
HEATING TIME COUPLING FACTOR FOR MICROWAVE OVEN

Wesley W. Teich, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 190,142, Sep. 24, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 356,058

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 B **2 Claims**



1. A microwave oven comprising:

a conductive cavity;

a magnetron for supplying microwave energy to said conductive cavity;

a weight sensitive device coupled to said cavity for generating a signal corresponding to the initial weight of food positioned in said cavity; and

a microprocessor responsive to said signal and an operator actuated control corresponding to the initial temperature of said food for determining a time period of exposure of said food to microwave energy and for controlling said magnetron in accordance with said time period, said time period being determined as a nonlinear function of said initial weight and calculated by an equation including a denominator term equal to said initial food weight divided by the sum of said initial food weight plus a constant; wherein

said constant corresponding to microwave energy losses to said oven, said losses being expressed in terms of equivalent food weight and said constant being approximately 0.1.

4,413,169

ELECTRO-SLAG WELDING PROCESS FOR IRREGULAR SECTIONS

John Cameron, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed Jan. 11, 1982, Ser. No. 338,591

Claims priority, application Canada, Jan. 23, 1981, 369258

Int. Cl.³ B23K *25/00*

U.S. Cl. 219—73.1 **14 Claims**

1. A method of welding a butt-joint between spaced opposing end faces of elongated metallic members having an irregular cross sectional area, corresponding to head, web and flange parts of a railroad rail, which comprises:

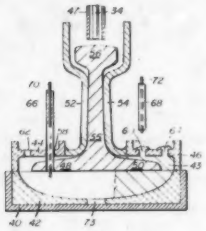
(a) providing a ceramic-lined crucible, including electrically conductive means, to substantially completely enclose said flange parts adjacent the end faces to be welded;

(b) positioning a consumable metal central electrode substantially vertically in said crucible in alignment with said web;

(c) positioning at least two additional electrodes substantially vertically in said crucible adjacent respective outer ends of said flanges;

(d) providing means in said crucible whereby an arc may be struck between said electrodes and said electrically conductive means;

(e) locating wall molds on opposite sides of said web and head parts adjacent said end faces to be welded thereby forming a mold space adjacent and in fluid communication with said crucible;



(f) adding a submerged melt welding slag composition to said crucible;

(g) supplying electric welding current to said central electrode and electrically conductive means to melt said welding composition, said central electrode at the tip thereof and adjacent metal of said end faces and at least partially fill said crucible with weld metal under a blanket of molten submerged melt welding composition;

(h) supplying electric welding current to said additional electrodes and weld metal while continuing to supply welding current to said central electrode so as to completely fill said crucible and fusion weld said flange parts together; and

(i) continuously melting said central electrode downwardly into the melt until the mold space between said wall molds and said web and head end faces is filled with weld metal under a blanket of molten submerged-melt welding composition, thereby fusion welding said web and head parts together.

4,413,170

THERMAL PRINTING HEAD

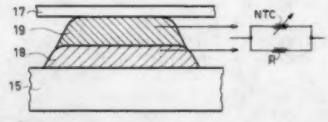
Christian Val, and Didier Pribat, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 17, 1981, Ser. No. 274,376

Claims priority, application France, Jun. 24, 1980, 80 13967

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—216 **6 Claims**



1. A thermal printing head comprising at least one strip of linear heating resistors, wherein each resistor is deposited on

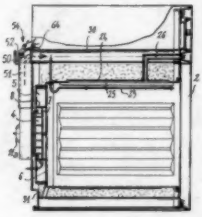
an insulating glass or ceramic substrate, whose thermal capacity is well above that of the heating resistor, and wherein it comprises at least a first layer of a material having a relatively constant resistivity as a function of the temperature and which is deposited in direct contact with the substrate and at least a second surface layer of a material whose resistivity varies in non-linear manner with the temperature and having a negative temperature coefficient, said second layer being deposited on the first layer.

4,413,171

ELECTRIC COOKING OVEN FOR DOMESTIC USE

Gerard Klammers, Thionville-Garche, France, assignor to Etablissements Eugene Scholtes, Lagrange-Thionville, France

Continuation-in-part of Ser. No. 218,747, Dec. 22, 1980, abandoned. This application Dec. 8, 1981, Ser. No. 328,643
Claims priority, application France, Dec. 27, 1979, 79 31753
Int. Cl.³ F27D *11/02*
U.S. Cl. 219—400 **4 Claims**



1. An electric cooking oven for domestic use comprising a cooking enclosure in which an air convection is produced, this air being heated by at least one electrical heating resistance and circulated by a centrifugal turbine mounted in a compartment formed in one of the enclosure walls, said turbine being surrounded by a perforated sleeve contacting said heating resistance so as to be brought to a red-hot condition when said resistance is energized, wherein an electric circuit is provided for controlling the cleaning of said enclosure by pyrolysis, said circuit comprising a pivoting shutter connected to a first control thermostat and to said turbine connected in turn to a second control thermostat so adjusted as to close at a predetermined critical temperature beyond which said turbine must be ventilated to protect same against overheating, said second thermostat being connected, when open, to an electric grill resistance capable of producing the pyrolytic cleaning operation, whereby said turbine will start up automatically when closing said second thermostat at said predetermined critical temperature in order to cause said shutter to pivot to a position in which said pivoting shutter keeps supplying electric power to said turbine while said second thermostat opens after the oven temperature has dropped to a value lower than said predetermined critical temperature.

4,413,172

METHOD OF HEAT CONTROL IN A SKIN PACKAGING MACHINE

Stephen H. Jones, LaFrance, S.C., assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 245,752, Mar. 20, 1981, Pat. No. 4,338,769. This application Jan. 18, 1982, Ser. No. 340,031
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—411 **6 Claims**

1. In a skin packaging machine having an oven having heating elements, a horizontal surface below said oven to which vacuum is applied, a film receiving frame between said oven and surface, means for raising and lowering said frame, a film supply adjacent said frame, and a power supply connected to said heating elements, the method of operating said skin packaging machine comprising the steps of,

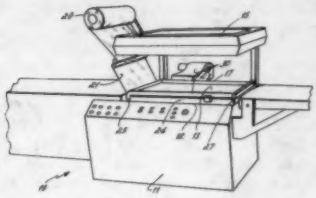
pulling film onto said frame,

raising said frame to a position adjacent said oven,

placing a substrate and object on said surface,

lowering said frame to place said film on said substrate and object,

and applying power to said heating elements as follows:



applying full power to said heating elements to heat said film for a first interval of time immediately prior to lowering said frame,

applying low power to said heating elements before pulling said film onto said substrate for a second interval of time extending to the beginning of said first interval of time,

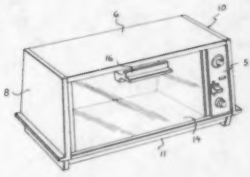
said low power being applied by switching power on and off during respective duty cycles.

4,413,173

ELECTRIC TOASTER CONTROL

Lawrence L. Grove, Lyme, Conn., and Donald G. Benner, Whitehall, Pa., assignors to General Electric Company, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,983
Int. Cl.³ A47J *37/08*; H05B *1/02*
U.S. Cl. 219—412 **2 Claims**



1. In an electric oven toaster having wall means including a front wall with an enlarged opening, a front door movably connected to said front wall for closing said enlarged opening, a heating means for supplying heat to a toasting chamber, a toast switch for energizing and de-energizing said heating means, a main switch connected to the door for energizing and de-energizing said heating means, and a toasting period controller for opening the toast switch means to de-energize the heating means at the end of a toasting cycle, the improvement comprising:

a. a manually operable lever positioned between said toast switch means and said toasting period controller for manually closing the toast switch means and starting the operation of the toasting period controller;

b. said toasting period controller including a solenoid arranged to be actuated at the end of a toasting cycle;

c. said solenoid including a solenoid coil and a movable core member;

d. said switch means being spring biased to an open position and said lever including a latch arm which is movable into engagement with the movable core member of said sole-

noid for holding the lever and said switch in a closed position against the spring bias of said switch;

e. said toasting period controller including means for actuating said solenoid at the end of the toasting cycle to move said movable core to release said latch arm from said movable core at the end of a toasting cycle to permit the switch to be opened under the force of its spring bias and to move the lever to an off position;

f. a toast cycle interrupt lever pivotally mounted on said toaster oven, said interrupt lever having a front facing surface and a rear facing surface; and

g. a door link connected to said door and movable therewith, the door link being engageable with the rear facing surface of said interrupt lever to move the interrupt lever front facing surface forwardly to engage the manually operable lever for releasing said latch arm from the movable core member of said toasting period controller when the door is opened so that the switch is opened and the leg of said manually operable lever is moved to return the toasting period controller to its starting position to thereby require a user to start a new full toast cycle when the door is reclosed.

4,413,174

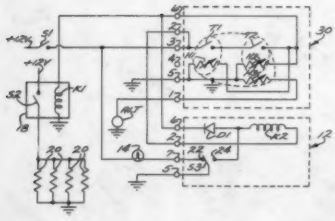
GLOW PLUG DUTY CYCLE MODULATING APPARATUS

Youn H. Ting, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 118,362, Feb. 4, 1980, abandoned. This application May 10, 1982, Ser. No. 376,482

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—511 **8 Claims**



1. Apparatus for modulating power supplied to a load comprising electrical energization means for energizing the load, a thermally responsive switch having a thermally responsive element, the switch being connectable to the electrical energization means, the thermally responsive switch having contacts which are normally closed but which will open when the thermally responsive element is subjected to preselected temperature conditions, heating means having a positive temperature coefficient (PTC) of resistance operatively connected to the thermally responsive switch by a thermal coupling, means to energize the heating means when the contacts of the thermally responsive switch are closed so that the thermally responsive switch will cycle on and off, a cut-off heater operatively connected to the PTC heating means by a thermal coupling, and means to energize the cut-off heater to cause the thermally responsive switch to be maintained in its contacts open configuration after a selected number of on-off cycles of the thermally responsive switch have been completed.

4,413,175

HEAT LEVEL INDICATION METHOD AND APPARATUS

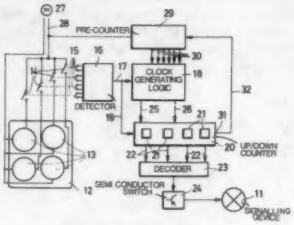
Wilfried Schilling, Kraichtal; Siegberg Lorenz, Bretten, and Friedrich Koch, Oberderdingen, all of Fed. Rep. of Germany, assignors to E.G.O. Regeltechnik GmbH, Fed. Rep. of Germany

Filed Jan. 22, 1981, Ser. No. 227,506

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003419

Int. Cl.³ G06G *7/00*; G01K *1/00*

U.S. Cl. 377—25 **23 Claims**



1. A method for indicating the thermal state of cooking appliances with an optical and/or acoustic signalling device, comprising the steps of:

continuously counting forward from a starting number in response to the heating means of the cooking appliance being switched on; and,

continuously counting backwards only after the heating means of the cooking appliance has been switched off, the signalling device being switched on when the count exceeds a first number and being switched off when the count falls below a second number.

4,413,176

PORTABLE TAPE READER

Tadayoshi Onuki, Sagamihara, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

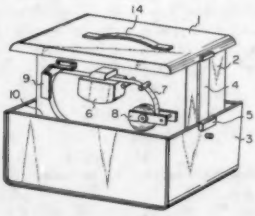
PCT No. PCT/JP81/00160, § 371 Date Mar. 3, 1982, § 102(e) Date Mar. 3, 1982, PCT Pub. No. WO82/00375, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 10, 1980, Ser. No. 355,722

Claims priority, application Japan, Jul. 10, 1980, 55-96182[U]

Int. Cl.³ G06K *7/04*

U.S. Cl. 235—445 **3 Claims**



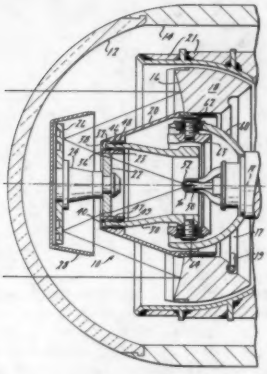
1. A portable tape reader characterized in that a lid provided with a handle is integrally formed on the upper portion of a body provided with a reading head, the body is contained in a container box so that the body can be drawn out upwardly, and when the body is drawn out, the container box is held in the lower portion of the body and an opening of the container box is located below said reading head.

4,413,177

OPTICAL SCANNING APPARATUS INCORPORATING COUNTER-ROTATION OF PRIMARY AND SECONDARY SCANNING ELEMENTS ABOUT A COMMON AXIS BY A COMMON DRIVING SOURCE

Paul K. Godwin, Jr., Farmington, Mich., and Ronald T. Honda, Irvine, Calif., assignors to Ford Motor Company, Dearborn and Ford Aerospace & Communications Corp., Detroit, both of, Mich.

Filed Nov. 30, 1981, Ser. No. 325,953
Int. Cl.³ G01J 1/20
U.S. Cl. 250—203 R 9 Claims



5. An optical scanning apparatus for providing a rosette scan pattern of focused images over the field of view of said apparatus, including:

a focused primary mirror means for defining said field of view and for conically scanning said defined field of view at a first rate and direction of rotation;

secondary mirror means in said optical path adjacent said primary mirror means for conically scanning said defined field of view at a second rate of rotation that is directly proportional to said first rate and in a rotational direction opposite to said first direction of rotation; and

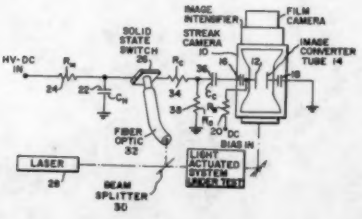
a single motor means for producing the rotation of said primary mirror means and the counter-rotation of said secondary mirror means.

4,413,178

SWEEP DRIVE CIRCUIT FOR A STREAK CAMERA

Gerard A. Mourou, and Wayne H. Knox, both of Rochester, N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,830
Int. Cl.³ H01J 31/50
U.S. Cl. 250—213 VT 24 Claims



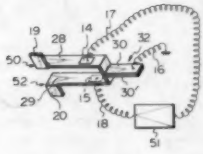
1. A streak camera sweep drive circuit for use with a streak camera for studying transient events having an image coverter tube which has deflection plates, said circuit comprising a radiation activated solid state switch, means for providing at the beginning of said sweep a charged circuit to a high voltage in kilovolt range which respect to a reference potential, said circuit including the capacitance presented by said deflection plates, a resistor connected to said deflection plates for providing a time constant long compared to the life time of the transient event, said switch being connected between one of said deflection plates and a point at said reference potential, and means for applying radiation to said switch for activating the same to initiate the sweep.

4,413,179

MECHANICAL VIBRATOR FOR LIGHT BEAM CHOPPER

Shoji Matsuoka, Tokyo; Ikutaro Kobayashi, and Junichiro Minowa, both of Yokosuka, all of Japan, assignors to Anritsu Electric Company Limited and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Feb. 24, 1981, Ser. No. 237,790
Claims priority, application Japan, Feb. 29, 1980, 55-24133
Int. Cl.³ G01D 5/36
U.S. Cl. 250—232 8 Claims



1. A vibrator for an optical chopper in a photosensor, which vibrator oscillates at a single frequency, said vibrator comprising:

a pair of separate vibrating plates of a thickness ranging from 0.1 to 1 mm and facing each other with a predetermined spacing therebetween;

a light chopping member formed at an end of one of said vibrating plates to interrupt a light beam to be measured, at said single frequency and having a thickness equal to that of one of said vibrating plates; and

a balancing member formed at one end of another one of said vibrating plates to maintain a balance relative to said light chopping member and having a thickness equal to that of one of said vibrating plates;

said vibrating plates having their other ends formed with flat portions bent from said vibrating plates, respectively, in symmetry relative to one another which flat portions are bonded to one another to form a stem portion to be supported.

4,413,180

METHOD AND APPARATUS FOR IMAGE ACQUISITION UTILIZING A HOLLOW SHAFT MOTOR AND A CONCAVE, CYLINDRICAL REFLECTOR

Charles J. Libby, West Roxbury, Mass., assignor to Automatix Incorporated, Billerica, Mass.

Continuation-in-part of Ser. No. 352,597, Feb. 26, 1982. This application Jan. 18, 1983, Ser. No. 458,836
Int. Cl.³ H01J 3/14
U.S. Cl. 250—236 28 Claims

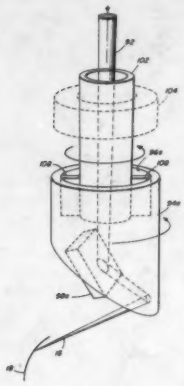
1. Method for image acquisition comprising the steps of:

A. passing a beam of collimated light through a hollow, rotatable motor shaft to a beam directing mirror that is secured with respect to and rotatable with said hollow, rotatable motor shaft;

B. reflecting said beam of collimated light from said beam directing mirror

C. impinging the resulting reflected beam of collimated light

on a concave, cylindrical reflective surface to produce a conical beam of light having an angular arc that is a function of the radius of the concave, cylindrical reflective surface and the width of the collimated light beam impinging thereon;



D. illuminating at least a portion of an object with said conical beam of light; and,

E. imaging at least part of said light beam illuminated portion of the object on an array of photosensitive elements to produce corresponding signals representative of the image on said array.

4,413,181
ARRANGEMENT FOR STROBOSCOPIC POTENTIAL MEASUREMENTS WITH AN ELECTRON BEAM TESTING DEVICE

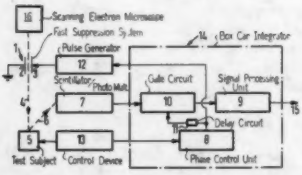
Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,134

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036660

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—310 **4 Claims**



1. An electron beam testing device system for stroboscopic potential measurements of a test subject, comprising: a scanning electron microscope having a beam suppression or blanking system in which an electron beam is deflected across an aperture in the blanking system during each edge of a blanking pulse connected to control the blanking system such that two electron pulses are generated per blanking pulse; blanking pulse generator means for producing said blanking pulse; detector means for producing a signal responsive to a secondary electron beam resulting from impact of each of the electron pulses on the test subject on which the potential measurements are being made; a signal processing means with an associated gate circuit for processing only the signal associated with one of said two electron pulses associated with each blanking pulse; and phase control means connected to control said gate circuit and said blanking pulse generator means.

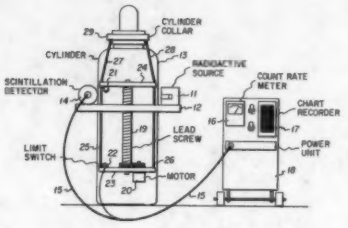
4,413,182
LEVEL DETECTOR

Daniel P. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1980, Ser. No. 221,144

Int. Cl.³ G01F *23/00*

U.S. Cl. 250—357.1 **1 Claim**



1. An apparatus for detecting the level of a nongaseous substance in a cylindrical chamber comprising a radioactive source means and a detector means mounted on a movable means in horizontally spaced fixed relation to each other, said source means and said detector means having a source-detector spacing angle at least as great as 90°, said source of radiation being adapted to emit a signal of energy whose magnitude is attenuated by the presence of nongaseous substances, said detector means being adapted to receive said radiation signal emitted by said source means and adapted to produce an electrical signal correlating to the strength of the radiation signal received by said detector, drive means adapted to move said movable means vertically, and recorder means being synchronized with movement of said movable means and adapted to record the magnitude of the electrical output signal produced by said detector means.

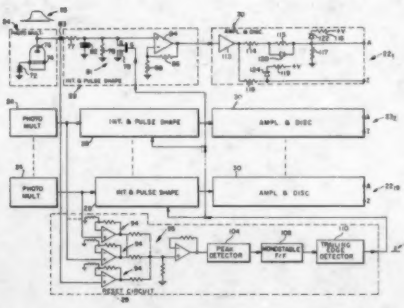
4,413,183
GAMMA CAMERA

Israel Metal, New York, N.Y., and Vincent Berluti, Jr., Southbury, Conn., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 29, 1980, Ser. No. 221,225

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—363 S **5 Claims**



3. A camera system comprising:

(a) an array of photodetectors arranged to locate flashes of light produced by a scintillator in response to an incident

gamma ray photon, a current pulse being produced by each one of such photodetectors in response to each incident gamma ray photon, the amount of charge produced by each one of such photodetectors being related to the portion of the energy of the photon detected by such one of the photodetectors, such current pulse rising from an initial level to a peak level and then returning to such initial level;

(b) a plurality of integrator means coupled to a corresponding one of the photodetectors for integrating the current pulses producing a voltage which increases from an initial reference level to a peak level representative of the amount of charge in the current pulse fed thereto, such peak level providing a measure of the portion of the energy of the photon detected by such one of the photodetectors;

(c) means responsive to the voltages for providing the location of flashes of light produced by the scintillator; and,

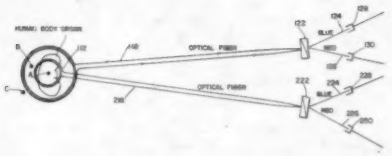
(d) means responsive to the current pulses for detecting the peak level of such current pulses and for resetting the voltage produced by the integrator means to the initial reference level a predetermined time after detection of the peak level of the current pulses.

4,413,184

OPTICAL FIBER RADIATION DETECTOR AND REAL-TIME DOSIMETER

Michael J. Marrone, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1981, Ser. No. 262,658
Int. Cl.³ G01T *1/20*; H05B *33/00*; G02B *5/14*
U.S. Cl. 250—368 **18 Claims**



1. A method of monitoring an area for the presence of ionizing radiation and measuring its accumulated dosage comprising:

providing a considerable length of silica core optical fiber in proximity to an area susceptible of receiving ionizing radiation, whereby, said optical fiber upon receiving ionizing radiation, lumineses at its ends substantially only in combined blue and red having peaks at around 450 nm and 650 nm, respectively;

dividing optical fiber end luminescence into two separate beams at near 450 nm and 650 nm, respectively; and,

measuring the intensity of the divided beams in which the intensity of red luminescence indicates the immediate presence of ionizing radiation and the intensity of blue luminescence indicates accumulated dosage of ionizing radiation.

4,413,185

SELECTIVE PHOTOIONIZATION GAS CHROMATOGRAPH DETECTOR

Richard C. Leveson, Willowdale, and Nicholas J. Barker, Don Mills, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Apr. 29, 1981, Ser. No. 258,575
Int. Cl.³ H01J *37/00*
U.S. Cl. 250—423 P **13 Claims**

1. A detector system, for use in the detection of gaseous or vaporous ionizeable chemical species entrained in air as a carrier gas, said system comprising:

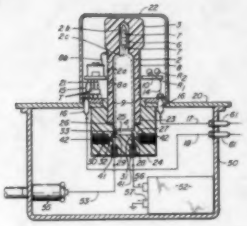
a source of high purity air as a carrier gas;

a gas chromatograph column for separating the chemical species to be detected from a mixture of said carrier gas and an ambient air sample containing said chemical species;

conduit means for connecting said source of high purity air to one end of said chromatograph column;

valve means associated with said conduit means for controlling the flow of air to said column;

injection port means in said conduit between said valve means and said one end of the chromatograph column for injecting a sample containing said chemical species into said conduit in gaseous or vaporous form to provide said mixture and



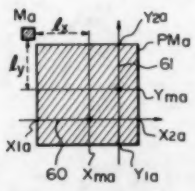
a photoionization detector, said detector including a cylindrical ionization chamber, said ionization chamber being closed at one end by a crystal window composed of a transmissive material and including electrodes for detecting the ionization of the chemical species and an external gas discharge tube disposed adjacent to and in alignment with said window, wherein the mixture is flowed through said ionization chamber to ionize the chemical species by continuous UV radiation from said discharge tube, said UV radiation being axially directed from said discharge tube into said ionization chamber through said window such that the radiation intensity is substantially uniform in any plane of the ionization chamber perpendicular to the direction of radiation into the chamber.

4,413,186

METHOD FOR DETECTING A POSITION OF A MICRO-MARK ON A SUBSTRATE BY USING AN ELECTRON BEAM

Kenyu Uema, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 25, 1980, Ser. No. 180,946
Claims priority, application Japan, Aug. 29, 1979, 54-109894
Int. Cl.³ H01J *37/00*
U.S. Cl. 250—491.1 **12 Claims**



1. A method for detecting the position of a substrate utilizing a micro-mark on a substrate by detecting reflected electrons or secondary electrons radiated from said substrate when scanned

by an electron beam, to determine a position where a predetermined exposure pattern should be formed by said electron beam into said substrate, the method comprising the steps of:

providing on said substrate a plurality of spaced-apart position mark chip areas and a plurality of device chip areas in which said predetermined exposure pattern is to be formed, each of said position mark chip areas being provided with a corresponding said micro-mark and at least one pilot mark which has a predetermined position relative to said micro-mark and is larger than said micro-mark, and each of said device chip areas being provided with a position mark,

scanning one of said position mark chip areas by said electron beam so as to detect and read out the position of said pilot mark therein,

determining the relative position of said read out position of said pilot mark with respect to said micro-mark so that the position of said micro-mark in said one of said position mark chip areas is determined,

scanning said micro-mark in said one of said position mark chip areas by said electron beam so as to detect precisely the position of the same,

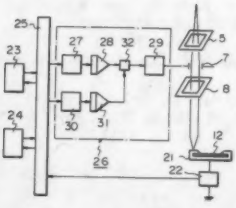
repeating said scanning of said position mark chip area step, said relative position determining step, and said micro-mark scanning step on another of said position mark chip areas thereby to determine the exact position of said substrate and correspondingly the position of each said device chip area on said substrate where said predetermined exposure pattern should be formed, and scanning each device chip area to detect said position mark therein to establish precise alignment of said predetermined exposure pattern with the scanned said device chip area and exposing said device area in accordance with said exposure pattern, in individual succession for said plurality of device chip areas.

4,413,187

METHOD FOR EXPOSING AN ELECTRON BEAM

Yuji Akazawa, Kawasaki; Toshihiko Osada, Ebina; Takaharu Shima, Sagamihara; Yuji Tanaka, and Masayuki Hattori, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 24, 1981, Ser. No. 295,584
Claims priority, application Japan, Aug. 26, 1980, 55-117412
Int. Cl.³ H01J *37/00*
U.S. Cl. 250—491.1 **6 Claims**



1. A method for providing an electron beam with a desired shape on the surface of a sample to form a desired pattern on said surface by using an electron-beam exposure apparatus, said apparatus comprising a first diaphragm having a first aperture for shaping the cross section of the electron beam into a polygon, a second diaphragm having a second aperture arranged so as to selectively stop the shaped electron beam corresponding to the image of the first aperture, wherein the position of the real image of said first aperture changes from the initial position of the ideal image during the operation of said electron-beam exposure apparatus, and a deflection unit for deflecting the electron beam having passed through said first aperture so as to position the shaped electron beam on a desired area on the second diaphragm according to said desired shape, said method comprising the steps of:

positioning a selected one of said ideal and real images of said first aperture on said second diaphragm;

moving said positioned image, by the operation of said deflection unit, between a position where at least a part of said shaped electron beam passes through said second aperture and a position where no part of said shaped electron beam passes through said second aperture;

detecting the part of the shaped electron beam passing through said second aperture;

determining the critical amount of deflection at which the shaped electron beam begins to pass through said second aperture from the results of said moving and detecting;

determining an offset value between the real image of the first aperture from the ideal image thereof; and

correcting the amount of deflection of the shaped electron beam having passed through said first aperture according to said offset value;

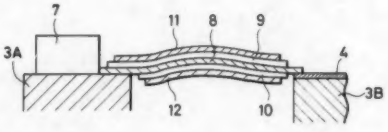
wherein the change in the position of the real image with respect to the ideal image, arising during operation of said exposure apparatus, may be corrected during said operation for providing said desired shape at the surface of the sample.

4,413,188

CAMERA TUBE APPARATUS FOR READING DOCUMENTS

Takashi Ozawa, and Mutsuo Takenouchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,873
Claims priority, application Japan, Dec. 10, 1980, 55-173227
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—578 **5 Claims**



1. A document-reading camera tube apparatus comprising:

a photoconductive layer;

a plurality of split electrodes provided on one surface of said photoconductive layer;

a plurality of common electrodes provided on the other surface of said photoconductive layer, each said common electrode overlying an end portion of a corresponding split electrode forming a light-receiving device therebetween, at least one of said split electrodes and common electrodes being transparent;

a plurality of reading switches, each said reading switch being connected between a corresponding light-receiving device and a corresponding output terminal;

a plurality of connecting electrodes, each said connecting electrode having a first end connected to a corresponding split electrode and a second end connected to a corresponding reading switch;

at least one insulating layer disposed adjacent said connecting electrodes; and

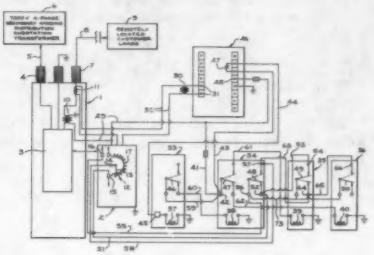
at least one conducting layer disposed on an outer surface of said at least one insulating layer opposite said electrodes, wherein capacitances formed between said electrodes and said conducting layer are significantly greater than capacitances of said light receiving devices.

4,413,189

DEMAND REDUCTION SYSTEM FOR REGULATED ELECTRIC UTILITY DISTRIBUTION CIRCUITS

Dudley Bottom, Jr., 900 Craig Ave., Shelbyville, Ky. 40065

Filed Nov. 9, 1981, Ser. No. 319,205
Int. Cl.³ H02J 3/12
U.S. Cl. 307—31 5 Claims



1. In association with a voltage regulator used for regulating the voltage on a single phase primary customer distribution circuit of an electric utility system of the conventional type which includes an auto-transformer, control circuitry for operating said auto-transformer, instrument transformers for sensing the voltage on and load current flowing in said distribution circuit, and negative resistance line drop compensating means operatively connectable to said control circuitry for reducing the regulated load voltage on said distribution circuit, a circuit for reducing the energy demand or load on said distribution circuit during periods of peak energy demand or load comprising

means connected to said current transformer for sensing when said load current increases to a first predetermined value and for thereafter sensing when said load current decreases to a second predetermined value, said second value being less than said first value,

a time delay relay responsively connected to said load current sensing means and adapted to actuate at a preselected time after said load current increases to said first value and to thereafter de-activate when said load current decreases to said second value, and

means responsively connected to said time delay relay for introducing said compensating means into said control circuitry upon activation of said time delay relay and for effectively removing said compensating means from said control circuitry upon de-activation of said time delay relay while maintaining continuity in a secondary circuit of said load current sensing instrument transformer.

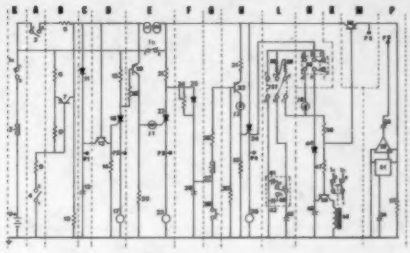
4,413,190

AUTOMATIC CONTROL DEVICE

Friedemann J. Schulz, 11 Richard St., Touraine by Gatineau Pt., Province of Quebec, Canada J8T 1G3

Filed Jun. 9, 1981, Ser. No. 269,267
Int. Cl.³ H03K 17/00
U.S. Cl. 307—241 9 Claims

1. A programmable control device for producing control power outputs in response to primary, secondary, delayed or directly applied input signals, and including programmable circuit means for resetting the control device, and comprising further means for controlling a number of intermediate power outputs in response to applied secondary input signals, whereas said means for controlling determine also a number of final power output repetitions before resetting of said control device is initiated and whereas said means for controlling comprises a basic subroutine circuit unit connected to an input data bus line and joined to a gated input signal storage circuit that is connected to a first inverted input gate circuit, whose output is joined to the input control gate of a first intermediate power output silicon controlled rectifier (SCR) and whereas the output of this device connects to the input of a secondary control gate, that responds only to repeatedly applied signal inputs to said input data bus line and whereas the output of said secondary control gate connects to the control gate of a second intermediate power output SCR, to trigger this device into conduction and comprising means whereas the output of said second intermediate power output SCR is joined to final means for extending said basic subroutine circuit units function by connecting a rapid charge-up timing circuit to the anode of said second intermediate power output SCR for selectively delaying and applying said second intermediate power output



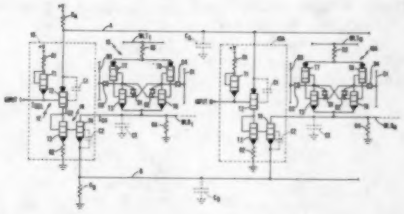
potential to a third inverted input gating circuit, whose output is joined to the gate of a succeeding constantly on control power output SCR to trigger this device into conduction while comprising additional means to connect said constantly on control power output to power output connectors and input connections of an output mode selector, whose output functions comprises means for activating selectively a primary output control timer, a selective automatic control device reset circuit, an output cycle repetition extention circuit and final DC and AC control power outputs.

4,413,191

ARRAY WORD LINE DRIVER SYSTEM

Russell J. Houghton, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1981, Ser. No. 260,576
Int. Cl.³ H03K 17/04, 17/16, 17/62
U.S. Cl. 307—254 16 Claims



1. A driver system comprising:

a first common conductive line,

a plurality of load lines,

a plurality of switching means, each of said means having a given capacitive element coupled to said common line and each of said means being connected between said common line and a respective one of said plurality of load lines,

means for precharging said common line and said plurality of load lines during a first period of time, and

means for selectively actuating one of said plurality of switching means during a second period of time for discharging said precharged common line to thereby effect the discharge of the respective load line of said actuated switching means.

4,413,192
TRANSISTOR FIRING CIRCUIT

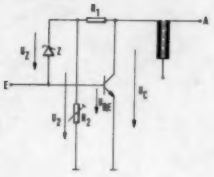
Linhard Niemetz, Nuremberg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 13, 1981, Ser. No. 263,101

Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019162

Int. Cl.³ H03K *3/00, 3/26;* **H01J** *29/70, 29/76*

U.S. Cl. 307—278 **4 Claims**



1. A transistor firing circuit comprising: a firing transformer having a primary winding across which a flyback voltage appears; means defining a circuit ground; a transistor having a base and a collector-emitter path, with said collector-emitter path being connected between said primary winding and said circuit ground; a resistive voltage divider connected in parallel with said collector-emitter path and including first and second resistors connected together at a center point, with said first resistor being connected between said center point and said primary winding and said second resistor being connected between said center point and said circuit ground; means defining a circuit input connected directly to said transistor base; and a Zener diode connected between said center point and said circuit input; wherein said first resistor has a temperature coefficient of resistance which is opposite in sign to the temperature coefficient to said Zener diode and of a value to compensate the temperature coefficient to said Zener diode in a manner to maintain the flyback voltage amplitude within narrow, defined limits over the operating temperature range of said circuit.

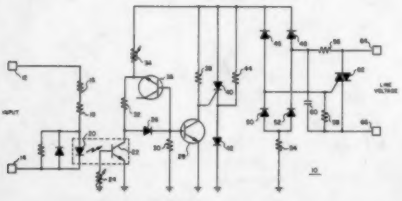
4,413,193
OPTICALLY COUPLED SOLID STATE RELAY

Charles R. Crockett, Arlington, Tex., assignor to Teccor Electronics, Inc., Euless, Tex.

Filed Jun. 11, 1981, Ser. No. 272,518

Int. Cl.³ H03K *17/60, 23/12*

U.S. Cl. 307—311 **11 Claims**



1. An optically coupled switching circuit adapted for controlling an alternating current power source, said switching circuit comprising:

means for emitting light in response to the application of an input signal;

a photosensitive transistor for detecting said light and for commencing conduction in response thereto;

detecting means including a reversed biased transistor emitter-base junction for precisely detecting the point at which said alternating current power source equals a particular voltage;

a gate controlled bilateral switching device for connection in series with said alternating current power source; and

means coupled to said photosensitive transistor and said detecting means, for triggering said gate controlled bilateral switching device in response to the conduction of said photosensitive transistor, if said alternating current power source is less than said particular voltage.

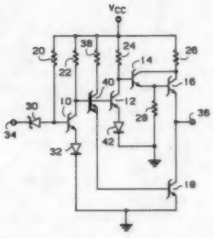
4,413,194
TTL OUTPUT CIRCUIT HAVING MEANS FOR PREVENTING OUTPUT VOLTAGE EXCURSIONS INDUCED BY NEGATIVE CURRENT REFLECTIONS

William A. Birch, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 10, 1981, Ser. No. 282,116

Int. Cl.³ H03K *19/003, 19/084, 19/088*

U.S. Cl. 307—456 **5 Claims**



1. In a logic circuit having input means for receiving one or more binary logic signals, a pull-up output transistor, a pull-down output transistor having at least a base terminal, a first switching transistor having at least a base terminal, coupled to said input means, a first current drive transistor having at least a collector terminal, for supplying drive to said pull-up transistor when said binary logic signals reach said first logic level, the improvement comprising:

second current drive transistor means having base, emitter and collector terminals, said base coupled to the collector of said first switching transistor, said collector being connectible to a first source of supply voltage and said emitter coupled to the base of said pull-down transistor for supplying drive to said pull-down transistor when said binary logic signals reach said second logic level; and

second switching transistor means having base, emitter and collector terminals, said base coupled to the collector of said first switching transistor, said collector coupled to the base of said first current drive transistor, and said emitter being connectible to a second source of supply voltage, said second switching transistor means for diverting drive from the base of said first current drive transistor when said binary logic signals reach said second logic level.

4,413,195
TRANSISTOR-TRANSISTOR-LOGIC CIRCUITS HAVING IMPROVED BREAKDOWN PROTECTION CIRCUITRY

William A. Birch, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 10, 1981, Ser. No. 282,118

Int. Cl.³ H03K *3/013, 17/16, 19/088, 19/20*

U.S. Cl. 307—456 **7 Claims**

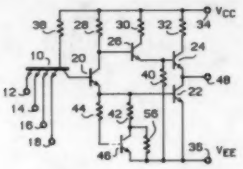
1. In a logic circuit having input means for receiving one or more binary logic signals, an output transistor having base, emitter, and collector terminals, an output terminal coupled to said collector terminal of said output transistor, and a current drive transistor coupled between the input means and the output transistor for providing turn on drive current for the

output transistor when binary logic signals concurrently applied to the input means reach a determined logic level, the improvement comprising:

a turn off drive transistor having an emitter, a base and a collector, said emitter of said turn off drive transistor being coupled to said emitter of said output transistor;

a first resistor coupled between said collector of said turn off drive transistor and the base of said output transistor;

a second resistor coupled between the base of said turn off drive transistor and the base of said output transistor, said turn



off drive transistor and said first and second resistors providing a discharge path from the output transistor when the latter is turned on; and

means coupled to said turn off drive transistor for sourcing leakage current away from said output transistor so as to prevent said output transistor from turning on due to said leakage current.

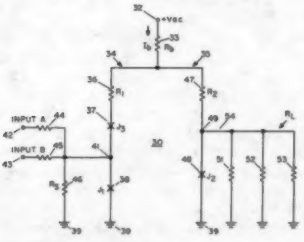
2. A logic circuit according to claim 1 wherein said means comprises a third resistor coupled in parallel with the collector-emitter path of said turn off drive transistor.

4,413,196

THREE JOSEPHSON JUNCTION DIRECT COUPLED ISOLATION CIRCUIT

Richard M. Josephs, Willow Grove, and Tsing-Chow Wang, Norristown, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,148
Int. Cl.³ H03K *19/195*
U.S. Cl. 307—462 **11 Claims**



1. A three Josephson junction direct coupled isolation OR gate circuit comprising:

a biasing current source;

a low reference voltage,

a first branch electrically connected in series between said biasing current source and said low reference voltage,

said first branch comprising a first resistor, a first and third Josephson junction in series with said biasing current source and said low reference voltage,

a signal input node,

a sink resistor connected between said signal input node and said low reference voltage,

said sink resistor being connected in parallel with said first Josephson junction,

a second branch electrically connected in series between biasing current source and said low reference voltage,

said second branch comprising a second resistor and a second Josephson junction in series between said biasing current source and said low reference voltage,

a signal output node,

a load impedance connected between said signal output node and said low reference voltage, and

said load impedance being connected in parallel with said second Josephson junction,

said Josephson junction circuit having a biasing current input flowing in said branches before, during and after the presence of an input signal at said signal input node to produce a signal at said signal output node,

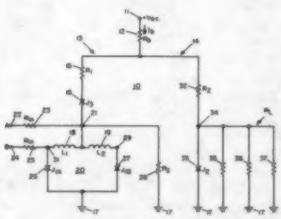
the critical current of said first Josephson junction and the critical current of said third Josephson junction being selectively predetermined to cause switching of said first, second and third Josephson junctions to occur in numerical order of said junctions.

4,413,197

FOUR JOSEPHSON JUNCTION DIRECT-COUPLED AND GATE CIRCUIT

Richard M. Josephs, Willow Grove, and Tsing-Chow Wang, Norristown, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,149
Int. Cl.³ H03K *19/195*
U.S. Cl. 307—462 **8 Claims**



1. A four Josephson junction direct coupled isolation AND gate circuit, comprising,

a biasing current source,

a low reference voltage,

a first branch electrically connected in series between said biasing current source and said reference voltage,

said first branch comprising a first resistor, a third Josephson junction and an interferometer in series between said biasing current source and said low reference voltage,

a first signal input connected intermediate said third Josephson junction and said interferometer,

a second signal input connected to said interferometer,

a sink resistor connected between said interferometer and said reference voltage and being connected parallel to said interferometer,

a second branch electrically connected in series between said biasing current source and said low reference voltage,

said second branch comprising a second resistor and a second Josephson junction in series between said biasing current source and said low reference voltage,

a signal output mode intermediate said second resistor and said second Josephson junction device, and

a load impedance connected between said signal output node and said low reference voltage,

said interferometer and said second and said third Josephson junctions having a predetermined critical current,

said critical current of said interferometer and said Josephson junctions being selectively predetermined to cause the switching of said interferometer to switch before said

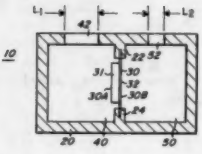
second Josephson junction and said second Josephson junction to switch before said third Josephson junction.

4,413,198

PIEZOELECTRIC TRANSDUCER APPARATUS

Jonathan R. Bost, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1981, Ser. No. 335,933
Int. Cl.[3] H01L *41/08*
U.S. Cl. 310—324 4 Claims



1. An electroacoustic device comprising:

piezoelectric driver means, having opposed major surfaces, for converting electrical signals applied thereto into acoustic energy radiating from each of said major surfaces, said driver means exhibiting a first predetermined resonant frequency;

first Helmholtz resonator means, acoustically coupled to one major surface of said driver means, and exhibiting appropriate dimensions for resonating at a second resonant frequency less than said first resonant frequency, and

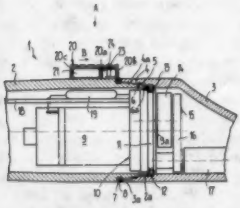
second Helmholtz resonator means, acoustically coupled to the remaining major surface of said driver means, and exhibiting appropriate dimensions for resonating at a third resonant frequency greater than said first resonant frequency.

4,413,199

ELECTRICAL TOOTH CLEANER APPARATUS

Franz Fischer, Triengen, Switzerland, assignor to Trisa Bürstenfabrik AG, Triengen, Switzerland

PCT No. PCT/CH80/00014, § 371 Date Oct. 5, 1980, § 102(e) Date Aug. 19, 1980, PCT Pub. No. WO80/01533, PCT Pub. Date Aug. 7, 1980
PCT Filed Feb. 1, 1980, Ser. No. 207,957
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1979, 2904327
Int. Cl.[3] H02K *7/14*
U.S. Cl. 310—50 15 Claims



1. An electrical tooth cleaning apparatus, comprising:

a housing composed of at least two mutually interconnected housing portions;

a drive motor arranged in said housing;

a support for a tooth brush arranged to be driven by said drive motor;

a vibration dampening element fixedly clamped between both of said housing portions;

said drive motor is mounted in said housing and is fixed in position by means of said vibration dampening element;

a snap connection for interconnecting both of said housing portions with one another; and

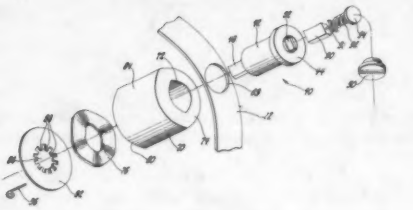
said snap connection is constituted by cooperating connecting elements provided on each of said housing portions.

4,413,200

DYNAMOELECTRIC MACHINE WITH CARTRIDGE BRUSH HOLDER

Robert D. Fenicle, Sylvania, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 4, 1981, Ser. No. 318,082
Int. Cl.[3] H02K *13/00*
U.S. Cl. 310—239 4 Claims



1. A dynamoelectric machine, including:

a tubular frame member having an inner surface and an outer surface, said inner surface and said outer surface being curved planar surfaces;

means for producing a stationary magnetic field affixed to said inner surface;

an armature rotatably disposed within said tubular frame adjacent said means for producing a staionary magnetic field and including an armature contact surface;

said tubular frame defining at least first and second apertures connecting said inner surface and said outer surface;

at least first and second cartridge brush holder means, each said brush holder means including a generally cylindrical body having a retaining flange at one end thereof, each said cartridge brush holder means being disposed through one said aperture and having said retaining flange disposed adjacent said outer surface;

at least two plano-convex members, each said plano-convex member having a first convex surface and a second flat surface and defining a bore therethrough connecting said first surface and said second surface, each said bore being adapted to receive one said generally cylindrical body of one said cartridge brush holder means therethrough;

each said plano-convex member being disposed about said generally cylindrical body of one said cartridge brush holder means and having said first surface disposed adjacent said inner surface;

at least two spring means, each said spring means defining an aperture therethrough, said aperture being adapted to receive one said generally cylindrical body therethrough;

each said spring means being disposed about one said generally cylindrical body adjacent one said plano-convex member adjacent said second surface;

at least two retaining ring means, each said retaining ring means defining an aperture therethrough, said aperture being adapted to frictionally receive one said generally-cylindrical body therethrough;

each said retaining ring means being disposed about one said generally-cylindrical body adjacent said spring means, to compress said spring means between said retaining ring means and said second surface, said spring means firmly drawing said retaining flange adjacent said outer surface to firmly retain said cartridge brush holder means in said tubular frame member.

4,413,201

DEVICE FOR ATTACHMENT OF COIL ENDS IN GENERATOR STATOR HIGH-VOLTAGE WINDING

Pavel Z. Nikitin, ulitsa Stroitelei, 5 korpus 1, kv. 2, Moscow; Yanush B. Danilevich, ulitsa Tipanova, 29, kv. 681, Leningrad; Konstantin N. Maslennikov, ulitsa Petukhova, 138, kv. 87; Konstantin F. Potekhin, ulitsa Stanislavskogo, 11, kv. 186, both of Novosibirsk; Lev A. Zolotov, bulvar Yana Rainisa, 9, kv. 55, Moscow; Veniamin S. Turutin, ulitsa Perovskaya, 8, korpus 1, kv. 26, Moscow; Tibor M. Nemeni, ulitsa Khalturinskaya, 11, kv. 245, Moscow; Alexandr I. Nikolsky, ulitsa Dubninskaya, 14, korpus 2, kv. 59, Moscow; Pavel S. Kabanov, ulitsa Sevanskaya, 19, korpus 1, kv. 22, Moscow; Gennady A. Bezchastnov, Polessky proezd, 4, korpus 2, kv. 33, Moscow, and Andrei M. Sharashkin, ulitsa S. Eizenshteina, 6, kv. 164, Moscow, all of U.S.S.R.

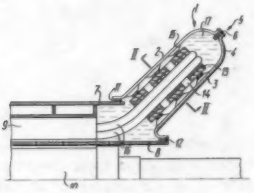
PCT No. PCT/SU80/00161, § 371 Date Jun. 25, 1981, § 102(e) Date May 11, 1981, PCT Pub. No. WO81/01223, PCT Pub. Date Apr. 30, 1981

PCT Filed Sep. 25, 1980, Ser. No. 269,043

Claims priority, application U.S.S.R., Oct. 25, 1979, 2824887

Int. Cl.³ H02K *3/46*

U.S. Cl. 310—260 **1 Claim**



1. A device for attachment of generator stator high-voltage winding coil ends, comprising insulation spacers disposed on external surfaces of the coil end bars, extra spacers disposed between the coil end bars, characterized in that it also comprises a case (1) made of two coaxial truncated cone members (2 and 3) and a part of a torus member (4) made integral therewith and provided with a joint (5) with a sealing (6), said case (1) accommodating insulation spacers (13), extra spacers (18), spring stops (15) secured inside the case (1) to the side surface thereof and located opposite each insulation spacer (13), and platens (14), each said platen (14) being disposed between two insulation spacers (13) and attached to one of them, the insulation spacers (13) being disposed between the winding coil end bars (16) and spring stops (15), each surface part of the insulation spacers (13), platens (14) and spring stops (15) and an inner side surface of the case (1) being used as cooling passages.

4,413,202

TRANSDUCER WITH A FLEXIBLE SENSOR ELEMENT FOR MEASUREMENT OF MECHANICAL VALUES

Peter Krempl, Vienna; Peter Claassen, and Helmut List, both of Graz, all of Austria, assignors to Hans List, Graz, Austria

Continuation of Ser. No. 107,315, Dec. 26, 1979, abandoned, which is a continuation of Ser. No. 927,929, Jul. 25, 1978, abandoned. This application Apr. 11, 1983, Ser. No. 482,279

Claims priority, application Austria, Jul. 27, 1977, A5505/77

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—338 **10 Claims**

1. An apparatus for determining the pressure of a fluid, said apparatus comprising

means forming a hollow enclosure in which the fluid whose pressure is to be measured is contained, said means including a wall member which has an edge surface that is configured to provide a cylindrical orifice that communicates with the interior of said hollow enclosure, said edge surface of said wall member including a continuous step portion which extends into said cylindrical orifice and a threaded portion, said step portion being positioned closer to the interior of said hollow enclosure than said threaded portion,

a domed membrane which has a diameter that is greater than the diameter defined by the step portion of said wall member, said domed membrane being positioned in said cylindrical orifice such that the periphery thereof is positioned between said step portion and said threaded portion of said wall member and is oriented such that the center thereof is positioned further from the interior of said hollow enclosure than said periphery,

a transducer means which has opposite ends and is positioned against the domed membrane on the side thereof facing away from the interior of said hollow enclosure,

said transducer means comprising at least one flexible piezoelectric film, at least one flexible piezoelectric film in said transducer means having opposite sides and an electrically conducting surface associated with at least a portion of at least one of the opposite sides thereof,

attachment means for stretching said transducer means across said domed membrane and thus across said orifice, said attachment means comprising an annular screw which has a threaded outer surface, said threaded outer surface of said annular screw being engaged with the threaded portion of said wall means such that the annular screw will cause the opposite ends of said transducer means to be clamped and the transducer means to be stretched over said domed membrane.

4,413,203

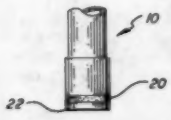
CATHODE-G_1 SPACING MATERIAL AND METHOD OF APPLICATION

Kenneth Speigel, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Division of Ser. No. 140,033, Apr. 14, 1980, Pat. No. 4,316,313. This application Sep. 30, 1981, Ser. No. 307,125

Int. Cl.³ H01J *1/88, 19/42*

U.S. Cl. 313—446 **2 Claims**



1. A structure for achieving critical spacing between the cathode and the control grid of an electron gun, said structure comprising:

a cathode,

a layer of potentially electron emissive material on an end of the cathode, and

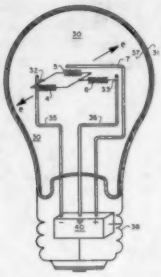
a spacer having a thickness substantially equal to said critical spacing, and in contact with said potentially emissive layer, said spacer containing at least one component which is selectively soluble in a solvent.

4,413,204

NON-UNIFORM RESISTANCE CATHODE BEAM MODE FLUORESCENT LAMP

Wojciech W. Byszewski, Arlington; A. Bowman Budinger, Westford; Joseph M. Proud, Wellesley Hills, and Leslie A. Riseberg, Sudbury, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 4, 1982, Ser. No. 336,815
Int. Cl.³ H01J 1/62
U.S. Cl. 313—491 10 Claims



1. A non-uniform resistance cathode beam mode fluorescent lamp comprising:
- a light transmitting envelope enclosing a fill material which emits ultraviolet radiation upon excitation;
- a phosphor coating, which emits visible light upon absorption of ultraviolet radiation, on an inner surface of said envelope;
- a power source external to said envelope;
- at least one thermionic cathode having first and second ends located within said envelope for emitting electrons;
- an anode located within said envelope for accelerating said electrons and forming an electron beam in response to a voltage applied between said anode and said cathode;
- a drift region within said envelope through which said electron beam drifts after passing through said anode;
- means for connecting said cathode and said anode to said power source;
- said thermionic cathode including resistance means for providing for increasing the emission of said electrons along an area proximal to said first end of said cathode and said means for decreasing the emission of said electrons proximal to said second end of said cathode whereby the emission of said electrons is substantially uniform along said cathode length.

4,413,205

HALOGEN INCANDESCENT LAMP WITH INTERNAL CURRENT CONDUCTORS OF TUNGSTEN-RHENIUM ALLOY

Leo F. M. Ooms, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1981, Ser. No. 266,574
Claims priority, application Netherlands, Jun. 26, 1980, 8003698
Int. Cl.³ H01K 1/20
U.S. Cl. 313—579 4 Claims

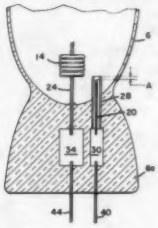
1. A halogen incandescent lamp having a vacuum-tight sealed glass lamp envelope which has a filling comprising bromine and an inert gas, and in which lamp a filament substantially of tungsten is connected to internal current conductors consisting substantially of tungsten and which extend inwardly from the wall of the lamp envelope, the internal current conductors consisting at least at their surface of tungsten containing at least 0.1% by weight of rhenium.

4,413,206

METAL HALIDE ARC DISCHARGE LAMP HAVING ELECTROLYSIS PREVENTION MEANS

Robert J. Karlotski, Weare; Joseph S. Kulik, Jr., Allenstown, and Martin E. Muzeroll, Merrimack, all of N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 4, 1981, Ser. No. 270,289
Int. Cl.³ H01J 61/00
U.S. Cl. 313—601 6 Claims



1. An arc discharge lamp comprising:
- an arc tube containing an ionizable discharge-sustaining fill including mercury and a metal halide;
- first and second main electrodes disposed within the arc tube;
- a starting electrode disposed within the arc tube adjacent the first main electrode; and
- a sleeve of electrically insulating material disposed about said starting electrode with said starting electrode recessed within said insulating sleeve, the lengths of said sleeve and said starting electrode being substantially shorter than but not less than about one-half the length of said first main electrode within said arc tube, said sleeve having an open end whereby said starting electrode is exposed to the internal atmosphere of said arc tube, and said starting electrode not projecting beyond the open end of said sleeve; whereby conduction between said first main electrode and said starting electrode is minimized or prevented during normal lamp operation, thereby minimizing or preventing electrolysis.

4,413,207

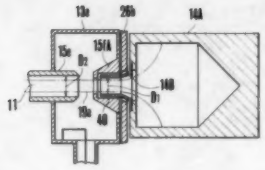
MULTICAVITY KLYSTRON

Takao Kageyama; Yoshiaki Suzuki, and Eiichi Watanabe, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,817
Claims priority, application Japan, Dec. 5, 1979, 54-157676; Dec. 5, 1979, 54-157677
Int. Cl.³ H01J 23/20
U.S. Cl. 315—5.52 6 Claims

1. A multicavity klystron comprising:
- (a) an electron gun for emitting a beam of electrons;
- (b) an input cavity resonator disposed adjacent to said electron gun for being supplied with an input signal to be amplified;
- (c) at least one intermediate driver cavity resonator disposed adjacent to said input cavity resonator;
- (d) an output cavity resonator disposed adjacent to said intermediate driver resonator for producing an amplified output signal;

(e) a collector disposed adjacent to said output resonator for receiving the beam of electrons;
(f) a plurality of drift tubes for passage therethrough of the beam of electrons from said electron gun via said cavity resonators to said collector;



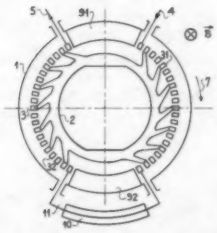
(g) said electron gun, said input, intermediate driver, and output cavity resonators, and said drift tubes being coaxially arranged; and
(h) one of said drift tubes which is mounted in said output cavity resonator and next to said collector having an inside diameter which is smaller than that of the other drift tubes.

4,413,208

HIGH GAIN CROSSED FIELD AMPLIFIER TUBE AND RADIO TRANSMISSION SYSTEM EQUIPPED WITH SUCH A TUBE

Jean Paul Morizot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 30, 1981, Ser. No. 279,198
Claims priority, application France, Jul. 1, 1980, 80 14626
Int. Cl.³ H01J *25/34*
U.S. Cl. 315—39.3 **5 Claims**



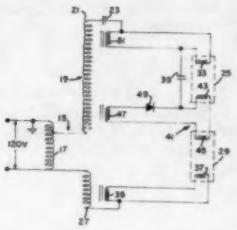
1. A crossed field amplifier tube comprising in a vacuum space
a cylindrical cathode
a delay line concentric thereto and which faces it over its entire height, a magnetic field parallel to the axis of the cathode being provided in the annular interaction region between the cathode and the delay line
an input for receiving the signal to be amplified located at one of the ends of the line, and
an output for supplying the amplified signal located at the other end, the output and the input being separated by a degrouping space wherein the common width of the delay line and the cathode parallel to the magnetic field is less at the input than at the output and at least one of the other parameters of the amplifier tube, such as the magnetic field, the cathode-line spacing, the pitch of the line is modified to maintain the synchronism $V_\phi = V_e$ wherein V_{100} is the phase velocity and V_e is the average azimuth speed.

4,413,209

SERIES-CONNECTED DISCHARGE DEVICE BALLAST APPARATUS

William J. Roche, Merrimac, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 5, 1981, Ser. No. 308,295
Int. Cl.³ H05B *41/16*
U.S. Cl. 315—101 **12 Claims**



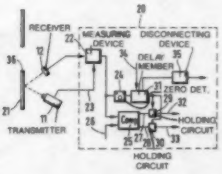
1. A ballast apparatus for starting and operating at least one pair of series-sequenced gaseous discharge devices wherein a transformer is coupled to a potential source and to opposite ends of said pair of series-sequenced gaseous discharge devices, a starting capacitor shunts one of the gaseous discharge devices and a filament of each of said gaseous discharge devices is connected in series by a circuit means and coupled to a filament winding of said transformer by way of a rectifier means whereby said rectifier means prevents operation of one discharge device when the other discharge device is operative.

4,413,210

AUTOMATIC GUIDING DEVICE FOR AN INDOOR GOODS TRANSPORTER

Jürgen Gronau, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Köttgen GmbH & Co. Kommanditgesellschaft, Bergisch Gladbach, Fed. Rep. of Germany

Filed Dec. 19, 1980, Ser. No. 218,411
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 3001146
Int. Cl.³ H04Q *7/02*
U.S. Cl. 318—16 **9 Claims**



1. An automatic guiding device for guiding a travelling vehicle in a path parallel to a stationary lateral surface at a predetermined distance from the lateral surface, the guiding device comprising:
transmitter means for transmitting a propagating wave signal to the lateral surface;
receiver means for receiving the wave signal reflected from the lateral surface;
measuring means responsive to the transmitter means and the receiver means, for determining the transit time of the wave signal from the transmitter means to the receiver means, and providing a signal indicative of the measured lateral distance from the vehicle to the lateral surface and for providing an outside range signal when the measured lateral distance is outside a predetermined range;

comparison means for comparing the measured lateral distance signal with a predetermined reference distance signal;

steering means responsive to the comparison means, for steering the vehicle so that the vehicle maintains a predetermined distance from the lateral surface; and

holding means responsive to the measuring means, for holding the steering means in response to the outside range signal so that the vehicle continues on the course set immediately prior to the measured lateral distance falling outside the predetermined range.

4,413,211

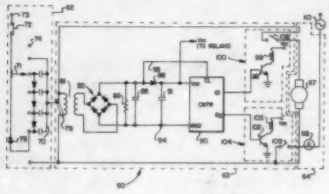
CONTROL CIRCUIT FOR ELECTRICAL APPLIANCES

Ricky C. Fowler, 2426 Village Green, Garland, Tex. 75042

Filed Dec. 23, 1981, Ser. No. 333,637

Int. Cl.³ H02P *7/74*

U.S. Cl. 318—257 **14 Claims**



1. A circuit for connection to a ceiling-type fan to control same comprising:

switch means responsive to a control signal, connectable to the fan to control the fan,

means for generating a control signal connected to control said switch means, and having an input for producing a change in the generated control signal responsive to a signal level change applied to the input,

a manual switch connected to apply an AC source to said input signal producing means and wherein said input signal producing means comprises means for converting a voltage of the AC source to a DC voltage having a first level when said manual switch is open and a second level when said manual switch is closed, whereby operation of said manual switch produces an interruption of said DC voltage to create a control signal to control said electrical device,

means connected to the manual switch and to the input of said control signal generating means for producing an input signal thereto, operative to produce a signal level change in response to the operation of said manual switch,

diode isolation means connected to receive the DC voltage and a capacitor connected to receive the DC voltage said capacitor connected to said diode to be charged by said DC voltage, said diode being connected to supply DC voltage to said control signal generating means and to said switch means, said capacitor being isolated by said diode isolation means from discharging into said AC converting means and being sufficiently large as to not discharge upon the occurrence of said control signal.

4,413,212

MOTOR CONTROL APPARATUS

Kiyokazu Okamoto, and Masayoshi Isomura, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,233

Claims priority, application Japan, Feb. 4, 1981, 56-15483

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—317 **3 Claims**

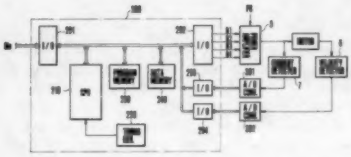
1. A motor control apparatus comprising:

rotary drive means for driving an object to be controlled;

velocity detecting means for detecting the velocity of said rotary drive means;

current detecting means for detecting the operating current of said rotary drive means;

a digital processor having a first arithmetic function for producing a current command data from an external velocity command data and a velocity detection data corresponding to an output of said velocity detecting means, a second arithmetic function for producing a drive command data from the current command data and a current detection data corresponding to an output of said current detecting means, and a third arithmetic function for converting the drive command data into on-off pulse signals,



said digital processor including input ports for receiving digital data of the velocity command data, velocity detection data and current detection data, a program memory for storing programs for performing a series of data processings on said digital data to apply a desired response characteristic to said rotary drive means, a reference timing generator which produces a signal necessary for executing said programs in synchronism with time, and an output port for delivering out the results of the data processing on the program as the on-off pulse signals; and

power amplifier means including switching elements for amplifying said on-off pulse signals to control the operation of said rotary drive means.

4,413,213

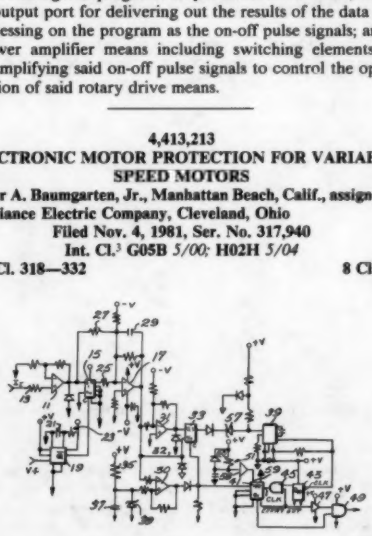
ELECTRONIC MOTOR PROTECTION FOR VARIABLE SPEED MOTORS

Arthur A. Baumgarten, Jr., Manhattan Beach, Calif., assignor to Reliance Electric Company, Cleveland, Ohio

Filed Nov. 4, 1981, Ser. No. 317,940

Int. Cl.³ G05B *5/00*; H02H *5/04*

U.S. Cl. 318—332 **8 Claims**



1. A motor protection circuit comprising:

means for generating a motor current signal having a value proportional to the magnitude of the input current to said motor;

means for generating a motor speed signal having a value proportional to the difference between the rated motor speed and the actual motor speed;

means responsive to said motor current signal and said motor speed signal for generating a product signal having a value proportional to the product of said motor speed signal and said motor current signal;

means for summing said motor current signal and said product signal;

means for determining if said product signal is greater than a preset level;

means responsive to said determining means for generating a clock pulse train when said product signal exceeds said preset signal, said product signal having a frequency proportional to said product signal level; and

counter means responsive to said clock pulse train when said sum signal exceeds said preset signal for counting said clock pulses, said counter generating a control output signal when said count reaches a predetermined level.

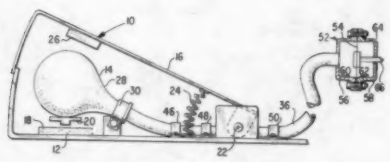
4,413,214
VENTED PNEUMATIC FOOT CONTROLLER

Jack Brown, Union, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 12, 1981, Ser. No. 320,393

Int. Cl.³ G05B *5/00*

U.S. Cl. 318—488 **6 Claims**



1. In combination, a pneumatic foot controller including a base, a foot pedal mounted for movement on the base, a bulb of an elastomeric material which is held at a defined location against movement relative to the base but which is movable about the defined location by foot pressure on the pedal, an insert in the bulb with a vent hole in the insert, a pad of elastomeric material which is affixed to an inside surface of the controller in a position to be forcibly engaged by the insert and to close the vent hole following movement of the bulb about said defined location, and spring means for moving the foot pedal away from the bulb whereby the insert is permitted to separate from the pad and open the vent hole when foot pressure is removed from the pedal; a pneumatic-electric transducer; tubing which connects the bulb to the transducer and through which the bulb controls pressure in the transducer; and an electric motor which is connected to the transducer and which has its speed regulated in accordance with pressure in the transducer.

4,413,215
MARINE TRIM AND TILT POSITIONING SYSTEM

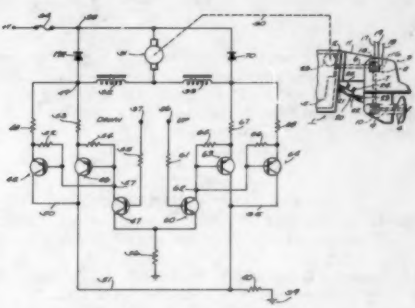
David T. Cavil, Menomonee Falls, and William R. Krueger, West Allis, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 1, 1981, Ser. No. 268,723

Int. Cl.³ G05D *1/00*

U.S. Cl. 318—588 **8 Claims**

1. Apparatus for controlling angulation, about a nominally horizontal axis, of a stern leg having a propeller and mounted outboard of a water craft for angulating between substantially vertical and a first angular limit defined as the trim range and a second angular limit defined as the tilt range, which apparatus comprises reversible electric motor means and means operatively coupling said motor means to said stern leg for said stern leg to be driven up through an increasing angle from vertical when said motor runs in one direction and down through a decreasing angle when said motor runs in the opposite direction, motor control circuit means connected with said motor means and responsive to being provided with first and second control signals by energizing said motor means from an electric power source to run in the one or the opposite direction, respectively, a trim angle control circuit having electric power input means, said circuit including manually settable means for producing a reference signal corresponding to the stern leg trim angle desired and position signal generating means for producing a signal corresponding to the present angle of the stern leg and varying with changes in said angle, comparator means for compariing the reference signal with the position signal and means responsive to said comparator means determining that said position signal corresponds to a stern leg angle less than the desired trim angle by providing said first control signal to thereby cause said motor means to run in said one direction for driving said stern leg up until the difference between the desired and present trim angle is nulled, and said means being responsive to said comparator means determining that said position signal corresponds to a stern leg angle greater



than the desired trim angle by providing said second control signal to thereby cause said motor means to run in said opposite direction for driving said stern leg down until the difference between the desired and present trim angle is nulled, and tilt control switch means comprising one and another switch each of which is manually actuable from one state to another for commanding said stern leg to tilt up and down, respectively, said switches being in a circuit wherein when they are both in one state they connect said power source to said power input means of said trim angle control circuit for energizing it to enable the trim function, and when either is actuated to its other state it will disconnect said power input means to disable and override the trim function and provide one or other of said first and second control signals to said motor control circuit for causing said stern leg to tilt up or down, respectively.

4,413,216
STATIC FREQUENCY CHANGER FOR FEEDING SYNCHRONOUS MACHINES

Detlef Knuth, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 936,518, Aug. 24, 1978, abandoned. This application Dec. 16, 1981, Ser. No. 331,304

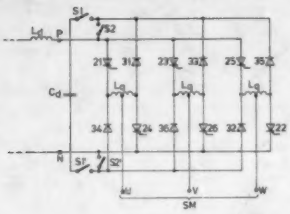
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738562

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—721 **3 Claims**

1. In a static frequency changer for feeding a synchronous machine, including a mains side static converter, a primary machine side static converter for which the commutation power is made available by the synchronous machine, and a smoothing inductance connecting the converters together, the improvement comprising: means defining an additional static converter composed of a plurality of diodes; a direct voltage capacitor connected in parallel to said additional static converter to form an intermediate circuit providing a direct voltage; means for connecting said primary machine side static converter and said additional static converter to the synchronous machine; and switch elements and control means therefor

selectively connecting said capacitor and said additional converter in parallel with said primary machine side converter, with said additional converter connected in parallel opposition to said primary machine side converter, said switch elements



and said control means therefor being switchable in dependence on the speed of rotation of the synchronous machine for connecting said additional converter to said primary machine side converter at least during operation of the machine in the upper portion of its speed range.

4,413,217

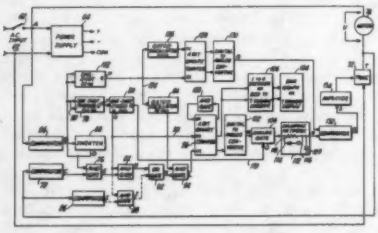
POWER FACTOR CONTROLLER

Dan Green, Cranford, N.J., and Sandor Goldner, Brooklyn, N.Y., assignors to Cynex Manufacturing Corporation, Hillside, N.J.

Continuation-in-part of Ser. No. 166,046, Jul. 7, 1980. This application Feb. 5, 1981, Ser. No. 231,611

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—729 **3 Claims**



1. A digital power factor controller for an AC induction motor comprising:

control means adapted to be electrically connected in series with the motor for controlling a voltage applied across the motor;

sensing means for providing gated clock signals whose count varies in accordance with a difference in phase between a current through the motor and the line voltage across the motor;

reference means for providing reference clock signals whose count represents a full cycle of the line voltage and wherein the count is reset for each zero crossing of the line voltage;

comparison means for comparing an output of said sensing means with an output of said reference means and producing a phase lag control signal, said control signal being applied to said control means for controlling a conduction angle of the voltage applied to the motor to thereby provide power to the motor commensurate with the motor loading;

said sensing means including first circuit means for sensing the line voltage and providing a square wave output in phase therewith, second circuit means coupled to said control means and providing a square wave output in phase with the current therethrough, and gating means for combining said square wave outputs from said first and second circuit means to provide square wave pulses representative of the phase difference between the voltage and current; and

a variable trigger circuit responsive to said first circuit means and providing an output whose duration is calibrated to equal a full load phase lag of the motor, a fixed trigger circuit activated by the end of said variable trigger circuit output providing an output of fixed duration, the output of said fixed trigger circuit limiting the operation of said gating means to correct for the full load phase lag.

4,413,218

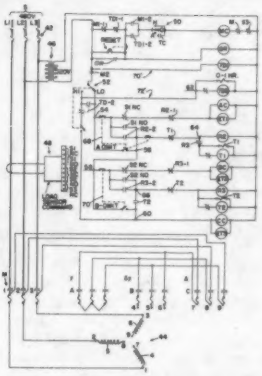
AUTOMATIC LOAD SEEKING CONTROL FOR A MULTITORQUE MOTOR

Noel R. Taylor, and Paul A. Taylor, both of Odessa, Tex., assignors to CMD Enterprise, Inc., Odessa, Tex.

Continuation-in-part of Ser. No. 27,798, Apr. 6, 1979, Pat. No. 4,220,440, which is a continuation-in-part of Ser. No. 854,389, Nov. 23, 1977, abandoned. This application Jun. 24, 1980, Ser. No. 162,475

Int. Cl.³ H02P *1/32*

U.S. Cl. 318—771 **9 Claims**



1. In a conveyor apparatus which conveys material from one location to another, wherein the mass of the conveyed material varies from one to another time interval, a three phase motor connected to move said conveyor, said motor having an automatic load seeking control circuitry for changing the stator winding of the motor from a high speed, high torque to a low speed, low torque configuration, comprising:

a motor starter means for connecting each stator winding to a source of current;

circuit means, including a first conductor means, for connecting the stator windings into a Y configuration;

sensor means responsive to a predetermined maximum average current flow which is actuated after said average current flow has occurred during a first time interval;

circuit means, including a second conductor means for connecting the stator windings into a Δ configuration when said second conductor means is energized;

means by which said sensor means, when actuated, deenergizes said first conductor means and thereafter energizes said second conductor means;

a timer device connected to cause said second conductor means to be de-energized and said first conductor means to be energized a finite interval of time following energization of said second conductor means;

said starter means includes circuit means by which said stator windings are selectively connected in one of said Y and Δ configuration to thereby enable the motor to start in either a high torque or a low torque mode;

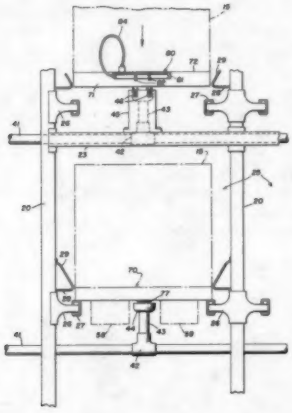
so that the motor can be started in Y or Δ configuration, and thereafter, said first and second conductor means will automatically change the winding configuration to either a high speed, high torque or low speed, low torque configuration depending upon the load imposed upon the motor.

4,413,219

FORK TRUCK BATTERY CHARGING SYSTEM

Ronald L. Ducharme, Grand Rapids, Mich., and Robin Taylor, Homewood, Ill., assignors to Interlake, Inc., Oak Brooks, Ill.

Filed Apr. 2, 1982, Ser. No. 364,677
Int. Cl.³ H02J 7/00
U.S. Cl. 320—15 **36 Claims**



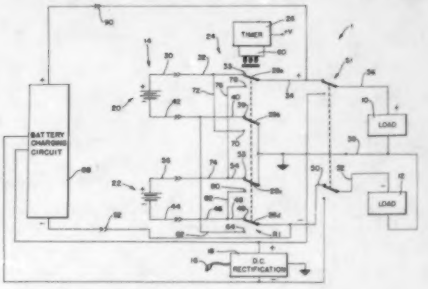
14. A battery charging system for supporting and interconnecting industrial storage batteries and associated chargers, said system comprising: rack means defining a plurality of battery locations and a plurality of charger locations; one or more pallets, each of said pallets including a body having a support surface for supporting an associated battery thereon, a plurality of recesses in said support surface communicating with one another to form a trough for receiving fluids from the associated battery, said trough having an outlet, and a connection block mountable on said body, said connection block including coupling means electrically connectable to a battery supported on said support surface and a first connector electrically connected to said coupling means; pallet support means at each of said battery locations for supporting a pallet thereat in a charging position; charger support means at each of said charger locations for supporting a charger thereat; fluid connection means on said rack having a plurality of fluid inlets respectively disposed at said battery locations for cooperation with the fluid outlet of said pallet when disposed in a charging position thereof in a selected one of said battery locations for collecting fluids from said fluid receiving means on said pallet; and a plurality of second connectors respectively disposed at said battery locations and respectively electrically connected to associated chargers at said charger locations, said first and second connectors being arranged for electrical interconnection in response to movement of a pallet to its charging position at a selected one of said battery locations to charge the battery on said pallet and for electrical disconnection in response to movement of said pallet from said charging position.

4,413,220

BATTERY DISCHARGE RATE CONTROL CIRCUITRY

Keith R. Waineo, Farmington Hills, Mich., assignor to GSE, Inc., Farmington Hills, Mich.

Filed Apr. 15, 1982, Ser. No. 368,560
Int. Cl.³ H02J 7/00
U.S. Cl. 320—15 **4 Claims**



3. An electrical system comprising:

a first load having at least one electrical component therein needing a positive supply voltage with a given power demand;

a second load having at least one electrical component therein needing a negative supply voltage with a different power demand;

an A/C power source;

a rechargeable battery supply having at least two batteries of substantially the same capacity connected together in series;

a battery charging circuit connected in parallel across said series connected batteries and being powered from said A/C power source; and

switching means interconnected between the batteries and the loads for periodically switching the connection therebetween, operative in a first position to connect one battery across said first load and the other battery across said second load, and being further operative in a second position to reverse the connection such that said one battery is connected across said second load and said other battery is connected across said first load whereby said batteries are discharged at substantially the same rate when said loads are powered by said batteries and wherein said batteries are automatically recharged in series from said battery charging circuit when the loads are powered by said A/C power source.

4,413,221

METHOD AND CIRCUIT FOR DETERMINING BATTERY CAPACITY

Fred Benjamin, Fullerton, and Robert H. Heil, Harbor City, both of Calif., assignors to Christie Electric Corporation, Torrance, Calif.

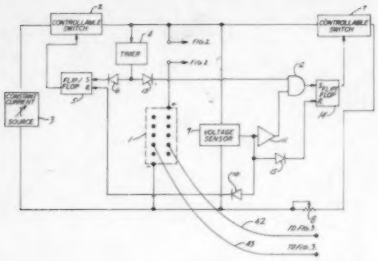
Filed Dec. 18, 1980, Ser. No. 217,897
Int. Cl.³ G01R 31/36
U.S. Cl. 320—48 **11 Claims**

1. A method of determining the capacity of a battery comprising the steps of:

imposing an increasing charge on a battery during a plurality of charge intervals and a plurality of discharge intervals interspersed with the charge intervals by applying a charge current to the battery during each charge interval;

applying a load to the battery during each discharge interval until the battery voltage decreases to a selected level;

removing the load in response to the attainment of the selected level to end the discharge interval; and



sensing the duration of each discharge interval as an indication of the capacity of the battery.

4,413,222

SELF-CONTAINED, PARTICULARLY VEHICULAR NETWORK WITH MALFUNCTION INDICATION

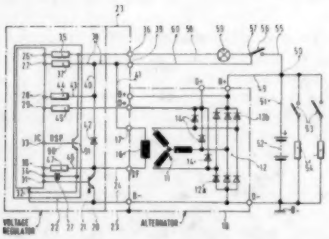
Willi Gansert, Kornwestheim; Ulrich Munz, Kirchheim, and Edgar Kuhn, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,493

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042194

Int. Cl.³ H02J *7/16*

U.S. Cl. 320—48 **16 Claims**



1. For combination with a self-contained electrical network having

an a-c generator (**10**) having a field-winding (**16**);

a power rectifier (**12**) connected to the generator and providing d-c output power at output terminals (B+, B−);

a battery (**52**) having positive and negative terminals (**50**, B−) and providing a battery or system voltage (u_s);

a battery cable (**49**) connected between the positive output terminal (B+) of the rectifier and the positive terminal (**50**) of the battery (**52**);

a plurality of loads (**54**) selectively connectable (**53**) between the battery terminals;

a voltage regulator (**20**) connected to the generator terminals and having a controlled power switch (**21**) which is serially connected to the field winding (**16**), and reference means (**62**, **63**, **64**) connected to compare the voltage of the output of the generator with a reference determined by the reference means and controlling the controlled power switch to conduct, or block current flow therethrough;

a network component malfunction indicator system having sensing means (**82**) connected (**24**, **30**, **47**) to the controlled power switch (**21**) and sensing the state of conduction thereof;

a malfunction indicator (**59**), and controlled switch means (**91**) connected thereto;

and logic circuit means connected to and controlling the controlled switch means of the malfunction indicator including

threshhold stage means (**67**, **69**) connected to a terminal having thereon a voltage representative of the voltage of the output of the generator to respond to the voltage of the output of the generator, and control said controlled switching means (**91**) to provide a malfunction output indication if the voltage of the generator output is beyond a predetermined range,

and comprising

means (**14**) deriving a generator sensing signal (u_g) of generator voltage solely due to the generator excitation and independent of battery voltage;

and wherein the threshold stage means comprises

a first threshhold stage (**67**) receiving said generator sensing signal and providing a first control signal if the generator voltage (u_g) exceeds a predetermined level ($u_r$max),

and a second threshhold stage (**69**) receiving a signal representative of battery, or system voltage (u_s) and providing a second control signal if the battery or system voltage (u_s) passes below a predetermined level ($u_r - \Delta u_1$).

4,413,223

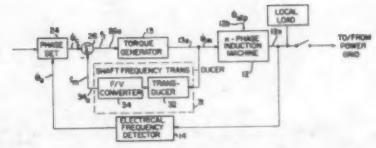
INDUCTION GENERATOR FREQUENCY CONTROL SYSTEM

George B. Yundt, Cambridge, and William P. Curtiss, Winthrop, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 27, 1981, Ser. No. 257,534

Int. Cl.³ H02P *9/42*

U.S. Cl. 322—32 **9 Claims**



1. A frequency control system for an induction generator including an n-phase induction machine having an input shaft and at least one output line, where n is an integer, comprising:

A. means for generating an electrical frequency control signal, θ_c, representative of the difference between the frequency of the voltage on said output line and a reference value,

B. means for generating a mechanical frequency control signal, f_m, representative of the frequency of rotation of said input shaft,

C. means for generating a torque generator control signal, f_t, representative of the difference between f_m and θ_c,

D. torque generating means responsive to f_t for applying a torque to said input shaft, said applied torque being related to f_t.

4,413,224

MICROPOWER SYSTEM

Yaakov Krupka, 8 Derech Yavne, Rehovot; Avi Bachar, 27 Cirelson St., Petah Tiqua, and Shmuel Yerushalmi, 38 Hanassi Harishon St., Rehovot, all of Israel

Continuation-in-part of Ser. No. 145,245, Apr. 30, 1980, abandoned. This application May 18, 1982, Ser. No. 379,338

Claims priority, application Israel, Apr. 30, 1979, 57186

Int. Cl.³ G05F *1/46*

U.S. Cl. 323—222 **2 Claims**

1. A DC/DC power conversion system including a power

source for providing a stabilized voltage that is greater than a voltage provided by said power source, said conversion system employing a switching regulator and comprising:

at least one primary electrochemical cell disposed in said power source;

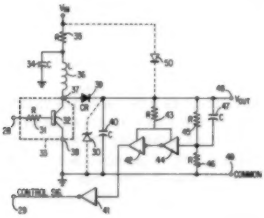
pulse generator means for providing a pulse train output;

AND gate means for receiving a control input and responsive thereto for passing said pulse train output of said pulse generator means as a gate output;

pulse driver means connected to said power source and to said AND gate means, and responsive to said gate output for providing a pulse driver output;

MOS-FET switching means connected to said pulse driver means and responsive to said pulse driver output for issuing a commutation output;

an inductor connected to said power source and to said MOS-FET switching means and responsive to said commutation output thereof for being commutated first across



said power source to be charged and thereafter released providing a discharge output;

a catch diode connected to said inductor for receiving said discharge output thereof, and issuing a diode output;

an output capacitor connected to said catch diode for receiving and being charged by said diode output, and providing a capacitor output voltage which increases as long as said commutation of said inductor continues;

a voltage-divider connected in parallel with said output capacitor for voltage dividing to produce a divided output; and

a voltage detector circuit comprising a pair of C-MOS inverters, drained via a common regenerative feedback resistor, the threshold of the C-MOS inverters serving as a voltage reference, said resistor also constituting current limiting means thereby resulting in an extremely low current drain of said inverters, said inverters being controlled by said divided output of said voltage-divider and issuing said control input to the said AND gate means.

4,413,225

METHOD OF OPERATING AN ELECTROSTATIC PRECIPITATOR

Gerhard Dönig, Erlangen; Walter Schmidt, Uttenreuth; Helmut Schummer, Heusenstamm, and Franz Neulinger, Dietzenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

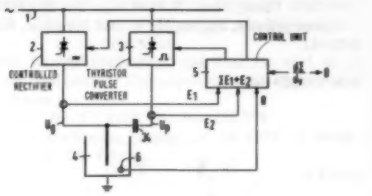
Filed Jul. 17, 1981, Ser. No. 284,491

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027172

Int. Cl.³ B03C *3/68*; G05F *1/56*

U.S. Cl. 323—246 **4 Claims**

1. A method for the operation of an electrostatic precipitator having a filter through which a gas containing dust is passed to result in a purified gas with a predetermined dust charge, with a DC voltage, the level of which can be varied, and with superimposed pulses, in which at least one of the parameters, pulse amplitude, pulse width, pulse repetition frequency and pulse rate of rise is variable, comprising automatically changing the DC voltage and/or one of the parameters of the pulses iteratively in such a manner that the sum of the electric energies of the DC voltage and the pulses absorbed by the filter



approaches a minimum, while a predetermined mean value of the dust charge of the purified gas is maintained.

4,413,226

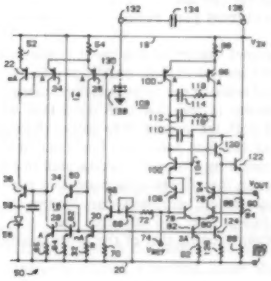
VOLTAGE REGULATOR CIRCUIT

Robert B. Davies, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1982, Ser. No. 352,906

Int. Cl.³ G05F *1/56*

U.S. Cl. 323—303 **9 Claims**



1. An integrated voltage regulator circuit for providing a DC regulated voltage at an output thereof, comprising:

a current source for producing first and second output currents at first and second outputs respectively, the magnitudes of said first and second currents being independent to ripple variations in a supply voltage applied thereto, said current source including a plurality of current sourcing transistors of a first conductivity type having emitter-base paths coupled in parallel to each other with the emitters being commonly adapted to receive said supply voltage, at least two of said transistors having respective collectors coupled to said first and second outputs of said current source, said commonly connected bases being adapted to be connected to an external terminal of the integrated circuit;

load circuit means coupled between said first and second outputs of said current source and a first terminal adapted to receive a ground reference potential, said load circuit means being adapted to receive a reference bias potential at an input thereof for producing the DC regulated voltage, the magnitude of which is proportional to the magnitude of said refernce bias potential;

frequency compensation compensation circuit means coupled between said first and second outputs of said current source for enhancing the supply voltage ripple rejection performance of the voltage regulator circuit; and

an external capacitor coupled between said external terminal and a second terminal at which said supply voltage is applied to the regulator circuit.

4,413,227

NEGATIVE RESISTANCE ELEMENT

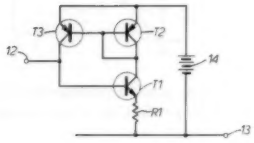
Kenneth C. Johnson, Cheadle, England, assignor to International Computers Limited, Stevenage, England

Filed Nov. 23, 1981, Ser. No. 323,801

Claims priority, application United Kingdom, Nov. 27, 1980, 8038142

Int. Cl.³ G05F *3/08*

U.S. Cl. 323—315 **3 Claims**



1. A voltage controlled negative resistance element comprising:

first and second terminals;

a first current path between the terminals such that on application of a voltage drop between the terminals a current is caused to flow through the first path in the direction of the applied voltage drop;

a second current path between the first and second terminals,

a first current mirror arrangement connected between said first and second current paths for controlling the magnitude and sense of the current in dependence of the value of the current in the first path such that variations in the second path are greater than and in the opposite sense to those of the first path, said first current mirror arrangement including a transistor connected in each said current path, with the effective base areas of the two transistors inter-connected, said transistors having similar characteristics except that the effective base area of one of the transistors exceeds that of the other transistor.

4,413,228

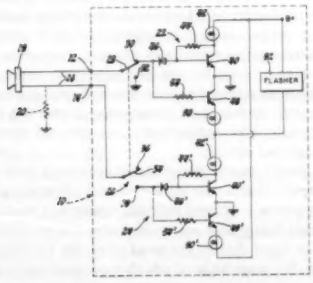
ELECTRICAL HARNESS ANALYZER

Hilton A. Turner, Jr., Rolla, Mo., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 25, 1981, Ser. No. 305,472

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—51 **2 Claims**



1. A harness analyzer circuit for testing an electrical harness for electrical resistance to ground and a short to ground comprising;

first and second indicators,

a first transistor of a first conductivity type having its emitter and collector serially connected with the first indicator between a voltage source and ground, a resistor connected between the collector and the base, and having its base adapted to be connected to one end of the harness under test, said resistor and the harness-to-ground circuit forming at least a part of voltage divider means connected to the base of said transistor whereby a base bias is developed such that if the harness is not connected to ground the transistor conducts to energize the first indicator and if the harness-to-ground resistance is less than a first value the transistor and the first indicator are turned off, and

a second transistor of conductivity type opposite that of the first transistor having its emitter and collector serially connected with the second indicator between the voltage source and ground and having its base adapted to be connected to the said one end of the harness, whereby a base bias is developed such that if the harness is not connected to ground the second transistor and second indicator are turned off, and if the harness-to-ground resistance is less than a second value which is higher than the first value the second transistor conducts to energize the second indicator, and if the harness-to-ground resistance is between the first and second values both transistors conduct to energize both indicators.

4,413,229

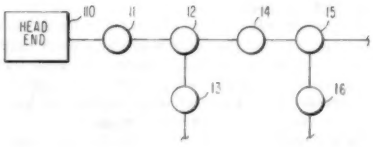
METHOD AND APPARATUS FOR REMOTE INDICATION OF FAULTS IN COAXIAL CABLE R-F TRANSMISSION SYSTEMS

William O. Grant, 9667 Lindenbrook St., Fairfax, Va. 22031

Filed Jun. 2, 1981, Ser. No. 269,624

Int. Cl.³ G01R *31/08*

U.S. Cl. 324—52 **17 Claims**



1. A method of remote fault location for a coaxial cable R-F transmission system comprising the steps of:

(1) inserting a predetermined fault locator signal frequency into said system;

(2) locating a plurality of passive R-F emitting coupler-filter units each tuned to said predetermined fault locator signal frequency at points in said system where it is desired to detect possible system faults, and each radiating said R-F fault locator signal into free space;

(3) traveling to and observing said predetermined fault locator signal frequency which is radiated into free space from each of said coupler-filter locations; and

(4) investigating for a possible fault at each coupler-filter location where a fault locator signal frequency is absent.

4,413,230

ELECTRIC ENERGY METER HAVING A MUTUAL INDUCTANCE CURRENT TRANSDUCER

Robert C. Miller, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 121,070, Feb. 13, 1980, abandoned, and a continuation-in-part of Ser. No. 13,938, Feb. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 923,619, Jul. 11, 1978, abandoned. This application Mar. 20, 1982, Ser. No. 360,738

Int. Cl.³ G01R *11/48, 1/20*

U.S. Cl. 324—142 **14 Claims**

1. An AC electric energy meter having an electronic measuring circuit processing analog signals responsive to current and voltage components of an alternating current electric

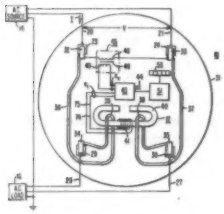
energy quantity supplied by conductors of a power line distribution system and to be measured for producing electronic signals representative of quantized amounts of electric energy consumption, said meter comprising:

a housing adapted for series connection of said meter with at least two of said power line distribution system conductors carrying separate current flows of said electric energy quantity to be measured;

a voltage sensing transducer connected in parallel with said power line distribution system conductors for producing a voltage responsive analog voltage signal proportional to said voltage component;

current sensing transducer means comprising first and second current conductors each connected serially with one of said power line distribution system conductors for series connection with each of the separate current flows of said current component, each of said current conductors effectively forming a single turn primary winding for producing magnetic flux variations responsive to the magnitude and rate of changes of the separate current flow therein;

said current sensing transducer means further comprising



secondary winding means comprising first and second toroidal windings each separately receiving one of said current conductors, each of said toroidal windings being wound on separate non-magnetic cores so as to include multiple turns each wound with a substantially rectangular cross section having a longer side substantially parallel to the single turn primary winding formed by said current conductors with the center openings of said toroidal windings being each mounted on separate non-magnetic cylindrical mounting sleeves carried by said current conductors so that said toroidal windings are inductively coupled to said magnetic flux variations of the associated current conductor through an effectively non-magnetic air gap space, and said toroidal windings further comprising lead wire conductors connected so that said secondary winding means produces a current responsive analog voltage signal linearly proportional to the sums of the time derivatives of the separate current flows in each of said current conductors throughout a ratio of combined current variations of at least four hundred to one with both of said voltage and current responsive analog voltage signals being effective for connection to high impedance and low level signal inputs of said electronic measuring circuit.

4,413,231

EDDY CURRENT INSPECTION PROBE FOR NON-DESTRUCTIVE INSPECTION OF TUBES WITH A PROBE BODY HAVING AN OUTER COILED SPRING SHEATH AND AN INNER PLASTIC MATERIAL SHEATH

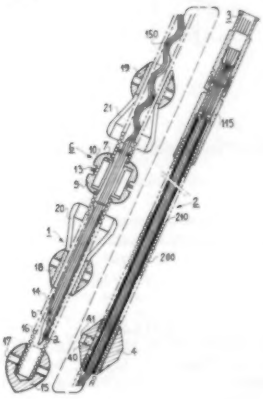
Albert Amedro; Bernard Audemard, and Rene De Mul, all of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Jul. 17, 1980, Ser. No. 169,779

Claims priority, application France, Jul. 24, 1979, 79 19080

Int. Cl.³ G01N *27/72, 27/82*

U.S. Cl. 324—220 **1 Claim**



1. An eddy current inspection probe for the non-destructive inspection of long tubes, said probe comprising: a measuring head, a probe body and connecting members, said probe body comprising a first, outer sheath constituted by a spiral spring having round contiguous turns, a second, inner sheath made from a plastic material having a low elongation strain co-efficient and cooperating with said first sheath in such a way that during the introduction of the probe into the tube to be inspected said first outer sheath has a limited deformation, while during the extraction of the probe from the tube, after an inspection, the second, inner sheath opposes any risk of elongation.

4,413,232

METHOD FOR DETECTING METAL OBJECTS IN A NON-METAL CONTAINER BY ROTATING THE CONTAINER THROUGH A PLANE OF DETECTION

Lynn W. Most, 1787 N. Rivercrest Rd., Lakeland, Minn. 55043, and Allen F. Most, 11701 Leeward Ave. South, Hastings, Minn. 55033

Continuation of Ser. No. 941,042, Sep. 11, 1978, Pat. No. 4,266,193. This application Feb. 11, 1981, Ser. No. 233,672

Int. Cl.³ G01R *33/12;* G01N *27/72*

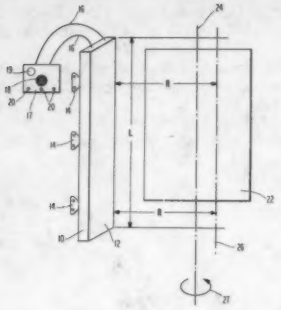
U.S. Cl. 324—236 **1 Claim**

1. A method of detecting metallic objects in a quantity of non-metal, comprising the steps of:

generating a plane of detection having a length "L" and a width "R";

bringing a container holding a quantity of non-metal which potentially contains metallic objects into said plane of detection, and rotating said container about an axis substantially parallel to length L and less than distance R from the generator of said plane and;

operably connecting an alarm means to be responsive to disturbances in said plane of detection during the rotation of



said container in said plane caused by the presence of metal therein.

4,413,233

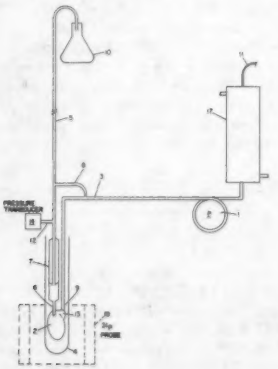
DYNAMIC NMR MEASUREMENT

Eric T. Fossel, and Joanne S. Ingwall, both of W. Newton, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Jul. 2, 1981, Ser. No. 279,721

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—300 **10 Claims**



1. Apparatus for dynamically measuring a chemical entity in living biological tissue having a physical characteristic capable of fluctuation, comprising

an NMR pulse spectrometer capable of providing an observation pulse for instantaneously measuring the spectrum of said chemical entity in said biological tissue,

sensing means for sensing said physical characteristic and providing an output signal, and

triggering means responsive to said sensing means output signal and connected to said spectrometer for triggering said spectrometer to produce said observation pulse at a selected point in the course of said fluctuation of said physical characteristic of said tissue.

4,413,234

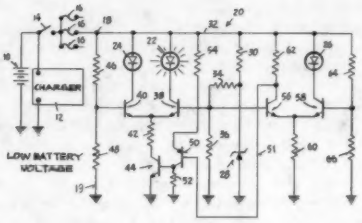
BATTERY-OPERATED CONDITION MONITOR

Peter J. Lupoli, Hamden, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,282

Int. Cl.³ G01N *27/46*

U.S. Cl. 324—435 **11 Claims**



1. A battery-condition tester for a vehicle having a storage battery and a charger connected with the storage battery, comprising in combination:

(a) a pair of light-emitting indicators connected in circuit with one side of the battery,

(b) current-control means connected respectively to control said indicators and in circuit with the other side of the battery,

(c) voltage-responsive means connected in circuit with both sides of the battery, for controlling said current control means to selectively energize one or the other of the indicators in response to a low battery voltage or else a normal battery voltage,

(d) a third light-emitting indicator connected in circuit with one side of the battery,

(e) over-voltage current-control means connected to control said third indicator and in circuit with the other side of the battery,

(f) an additional voltage-responsive means connected in circuit with both sides of the battery, for turning on said over-voltage current-control means to energize said third indicator in response to an over-voltage of the battery, and

(g) means controlled by said over-voltage current-control means, for turning off said first-mentioned current-control means to extinguish said pair of light-emitting indicators when the over-voltage current-control means is operative to energize the third indicator.

4,413,235

LOW TEMPERATURE COEFFICIENT LOGARITHMIC ELECTRONIC GAIN CONTROLLED AMPLIFIER

Barry L. Jason, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 23, 1981, Ser. No. 236,944

Int. Cl.³ H03F *3/45*; H03G *3/10*

U.S. Cl. 330—254 **5 Claims**

1. A low temperature coefficient, logarithmic gain controlled amplifier circuit, comprising:

(a) an amplifier having a supply terminal and having a gain which is proportional to the supply current of the amplifier through the supply terminal;

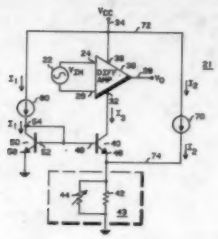
(b) an impedance network having one end coupled to a reference level and having a variable resistance;

(c) a first active current source, having a current linearly dependent upon temperature;

(d) a second active current source, having a current linearly dependent upon temperature;

(e) current control means coupled to the first current source, the second current source and the impedance network, and coupled to the amplifier, for controlling the supply

current through the amplifier in response to the currents of the first and second current sources and the impedance of the impedance network whereby the gain of the amplifier is maintained substantially temperature independent over a wide range of impedance network impedance values.



4,413,236

CIRCUIT FOR DERIVING A TIMING SIGNAL FROM DIGITAL IMPUT SIGNALS

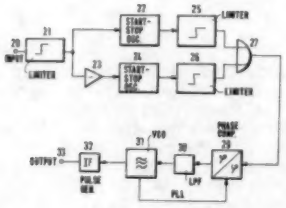
Josef Sochor, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1980, Ser. No. 216,938

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951134

Int. Cl.³ H03L 7/06

U.S. Cl. 331—25 **2 Claims**



1. Electrical circuit for producing a timing signal for the regeneration of pulses, said circuit comprising a first start-stop oscillator **(22)**, a second start-stop oscillator **(24)**, a combining circuit **(27)**, a phase comparator circuit **29**, a low pass filter **(30)**, a variable oscillator **(31)**, a pulse generator **(32)**, means **(20,21)** for supplying input signals to said first start-stop oscillator **(22)**, means **(20,21,23)** for supplying inverted input signals to said second start-stop oscillator **(24)**, means **(25)** for supplying the output signals of said first start-stop oscillator **(22)** to said combining circuit **(27)**, means **(26)** for supplying the output signals of said second start-stop oscillator **(24)** to said combining circuit **(27)**, means for supplying the output of said combining circuit **(27)** to a first input terminal of said phase comparator circuit **(29)**, means for supplying the output signal of said phase comparator circuit **(29)** to said low pass filter **(30)**, means for supplying the output signal of said low pass filter **(30)** to said variable oscillator **(31)**, means for supplying the output signal of said variable oscillator **(31)** to a second input terminal of said comparator circuit **(29)** and to said pulse generator **(32)**.

4,413,237

SAWTOOTH WAVE OSCILLATOR

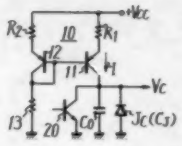
Yasuharu Baba, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 10, 1981, Ser. No. 242,394

Claims priority, application Japan, Mar. 14, 1980, 55/32954

Int. Cl.³ H03K 4/50

U.S. Cl. 331—108 C **4 Claims**



1. A sawtooth wave oscillator comprising:

(a) a series circuit of a first capacitor means and a charging means for producing a first current;

(b) a discharging means connected in parallel with said first capacitor means; and

(c) a second capacitor means having a capacitance which decreases in accordance with increase of the reverse bias across said second capacitor means and connected in parallel with said first capacitor means and their terminals connected together wherein decrease of said current due to increase of voltage at the junction point of said charging means and said first capacitor means corresponds to the decrease of capacitance of said second capacitor means, so that the non-linearity sawtooth wave caused by decrease of said first current is improved.

4,413,238

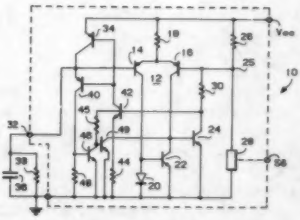
PRECISION DIFFERENTIAL RELAXATION OSCILLATOR CIRCUIT

W. David Pace, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1981, Ser. No. 298,127

Int. Cl.³ H03K 4/50

U.S. Cl. 331—111 **10 Claims**



1. Differential relaxation oscillator, comprising:

frequency determining means including a capacitor which is charged and then discharged between upper and lower voltage levels;

comparator means having first and second inputs and an output, said first input receiving a threshold voltage, said second input being coupled to said capacitor, said comparator means being switched from a first operating state to a second operating state when the voltage across said capacitor exceeds a first threshold voltage level supplied at said first input;

charge circuit means for producing charging current when enabled to cause charging of said capacitor;

control circuit means coupled between said first input and said output of said comparator means and having an output coupled to said charge circuit means which when enabled both causes said threshold voltage to be reduced to a second voltage level and said charge circuit means to be disabled thereby allowing said capacitor to be discharged;

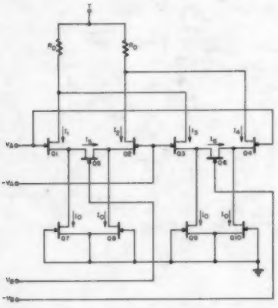
current detecting means coupled between an output of said charge circuit means and said output of said comparator means which detects a current produced at said output of said charge circuit means when said capacitor is charged to said upper voltage level for enabling said control circuit means such that said capacitor is discharged to said lower voltage level at which said comparator means switches to said first operating state thereby disabling said control circuit means which then enables said charge circuit means.

4,413,239

FIELD EFFECT TRANSISTOR CIRCUIT FOR MODULATOR AND DEMODULATOR APPLICATIONS

Donald E. Romeo, Westminister, and George W. McIver, Redondo Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1981, Ser. No. 276,224
Int. Cl.³ H03C *1/00;* H03D *1/18;* G06G *7/161*
U.S. Cl. 332—16 T **2 Claims**



1. Apparaus for producing a signal proportional to the product of two differential input signals comprising:

first and second pairs of field effect transistors,

each of the field effect transistors of said first and second pairs having gate, source and drain electrodes,

a first series connected field effect transistor having a source electrode and a drain electrode connected in series between the source electrodes of one of said pairs of field effect transistors and having a gate electrode,

a second series connected field effect transistor having a source electrode and a drain electrode connected in series between the source electrodes of the other of said pairs of field effect transistors and having a gate electrode,

said source electrodes of said pairs of field effect transistors being held at a common reference potential,

means for applying a first differential input signal across the gate electrodes of each of said pairs in parallel,

means for applying a second differential input signal across the gate electrodes of said first and second series connected field effect transistors, and

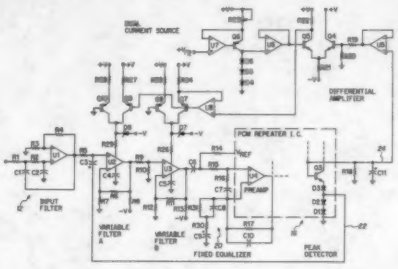
loading circuit means connected to the drain electrodes of said pairs of field effect transistors for providing an output signal proportional to the product of said first and second differential input signals.

4,413,240

AUTOMATIC LINE BUILDOUT CIRCUIT FOR DIGITAL DATA TRANSMISSION

Harry J. Dyke, Oak Forest, Ill., assignor to Rockwell International Cororation, El Segundo, Calif.

Filed Nov. 9, 1981, Ser. No. 319,840
Int. Cl.³ H03H *11/06*
U.S. Cl. 333—17 R **5 Claims**



1. An automatic line buildout circuit for equalizing a cable in response to a signal therefrom, comprising:

a variable filter in the path of said signal, having a transconductance operational amplifier connected to provide a transfer function pole with a frequency which is directly related to a control current to be applied to the filter;

peak detector means responsive to the signal in said path after filtering by said variable filter, for providing an output level approximately proportional to the length of said cable; and

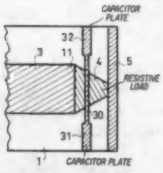
current source means for generating said control current as a selected function of said peak detector means output level, thereby causing the frequency associated with said pole to vary with the cable length according to said selected function, said selected function being defined by said control current increasing exponentially with increasing peak detector means output level.

4,413,241

TERMINATION DEVICE FOR AN ULTRA-HIGH FREQUENCY TRANSMISSION LINE WITH A MINIMUM STANDING WAVE RATIO

Sylviane Bitoune; Pierre Dufond; Francois Herrbach, and Maurice Lecreff, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 8, 1981, Ser. No. 281,393
Claims priority, application France, Jul. 11, 1980, 80 15497
Int. Cl.³ H01P *1/26*
U.S. Cl. 333—22 R **8 Claims**



1. A load device adapted to the characteristic impedance of a transmission line with a flat structure, comprising a conductor constituted by a metal strip deposited on an insulating substrate and at least one earth electrode, the metal strip being connected by its end to a resistive film, which is itself connected to earth, wherein the resistive film is of a decreasing width along the entire length between its points of connection to the metal strip and to earth, and wherein said resistive film

is shaped like a trapezoid, whose large base is connected to the conductor and whose small base is connected to the earth plane.

4,413,242

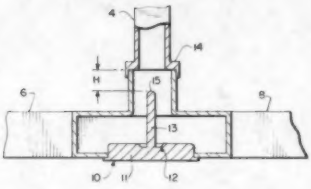
HYBRID TEE WAVEGUIDE ASSEMBLY

Albert H. Reeves, Linden, and Joseph S. Michalski, Morris Township, Morris County, both of N.J., assignors to Litton Systems, Inc., Morris Plains, N.J.

Filed Aug. 31, 1981, Ser. No. 298,225

Int. Cl.³ H01P *5/20*

U.S. Cl. 333—122 **9 Claims**



1. A hybrid junction having enhanced power handling capacity, said hybrid junction having an H-plane arm, an E-plane arm and two collinear side arms formed of waveguide sections, said power being suppliable to said hybrid junction at the input of the H-plane arm, said hybrid junction including an H-plane arm matching post located in the junction formed by the intersection of the E-plane arm, the H-plane arm and the two collinear side arms and extending into the E-plane arm said E-plane arm having a known height, said matching post having a diameter such that the ratio of the E-plane arm height to the post diameter would yield a characteristic impedance of approximately 60 ohms in a transmission line having a circular center conductor extending between parallel ground planes having dimensions and a geometric relationship equivalent to the dimensions and geometric relationship of said matching post in relation to said E-plane arm, whereby the maximum power transfer without breakdown is achieved in said hybrid junction.

4,413,243

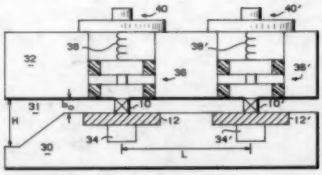
OPTIMIZED TRANSMISSION LINE SWITCH

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 19, 1981, Ser. No. 312,206

Int. Cl.³ H01P *1/15*

U.S. Cl. 333—258 **12 Claims**



1. In a transmission line an optimized switch, comprising:

a first switchable element in the transmission line, said first switchable element introducing a predetermined first capacitance across the transmission line while said first switchable element is in a first state;

capacitive means in the transmission line for counteracting said first capacitance; and

at least one portion of the transmission line interposed between said first switchable element and said capacitive means along a propagation direction of said transmission line, said at least one portion having a predetermined impedance and an electric length not equal to an integral multiple of 90°, said predetermined impedance of said at least one portion being identical to an impedance of at least a local region of the transmission line.

4,413,244

ELECTROMAGNET

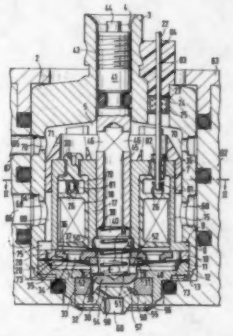
Udo Hafner, Lorch, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,370

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111938

Int. Cl.³ H01F *7/10*

U.S. Cl. 335—250 **4 Claims**



1. A housed electromagnet device for the actuation of a fuel injection valve for fuel injection systems of internal combustion engines, a carrier body having a magnetic coil mounted on a core of ferromagnetic material and an armature, said device further including a supply of electric current to said magnetic coil via contact prongs which protrude into said housing and are connected with said magnetic coil in an electrically conductive manner, characterized in that said housing is further provided with means defining an opening through which electrical contact means is arranged to extend, a conically tapering centering opening in said carrier body for the protrusion of said contact means therethrough, said electrical contact means having at least a terminus which engages fully enclosed loop elements provided on said magnetic coil, and said loop elements at least partially encircling said terminus of said electrical contact means, whereby said terminus of said electrical contact means is brought into engagement with said loop elements.

4,413,245

INDUCTIVE MEASURING TRANSDUCER FOR A FLUIDIC ADJUSTING MEMBER

Reiner Bartholomäus, Neuendorf; Christoph Gibas, Neunkirchen; Hans Wölfges; Ferdinand Hess, both of Lohr, and Karl Schiene, Sulzbach, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 136,327, Apr. 1, 1980, abandoned. This application Aug. 19, 1981, Ser. No. 294,214

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914195

Int. Cl.³ H01F *15/04, 21/06*

U.S. Cl. 336—84 M **4 Claims**

1. An improved inductive measuring transducer which is impermeable to fluid pressure agents for use with a fluidic adjustable member such as a multiple position valve or flow valve, the transducer being of the type comprising a receiving casing of non-magnetic material for receiving a core, a plural-

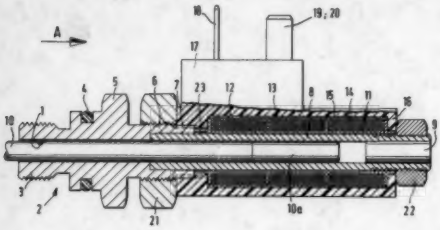
ity of coils surrounding said receiving casing and the core, a housing surrounding said coils, and a connecting member, the improvements wherein

said receiving casing comprises a single continuous, hollow cylindrical tube having a plug seated directed in and closing one end thereof in fluid tight relationship;

said connecting member is formed as a separate component from said receiving casing and is fixedly connected to the exterior of the other end of said tube in fluid tight relationship, said connecting member being spaced from said coils to permit adjustment of the relative positions thereof;

said housing comprises a body of polymeric material completely enclosing said coils;

said housing and said coils surround said receiving casing



and are axially movable as a unit relative to said receiving casing between said connecting member and said one end of said receiving casing;

said core is disposed on one end of a rod, and said core and rod have substantially equal transverse cross-sectional dimensions;

first and second adjusting nut means are mounted at opposite ends of said housing for adjusting the axial position of said housing and coils relative to said casing and for firmly holding said housing and coils against movement; and

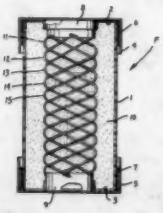
means are provided on said housing and said connecting member for preventing relative rotation between said coils and said casing, said means for preventing rotation including a plurality of mating projections and recesses formed in said housing and said connecting member.

4,413,246

METALLIC COATING FOR A CADMIUM FUSE

Arthur C. Westrom, Stone Mountain; Billy R. Livesay, Atlanta, and James W. Larsen, East Point, all of Ga., assignors to Kearney-National Inc., Atlanta, Ga.

Filed Aug. 27, 1981, Ser. No. 296,986
Int. Cl.³ H01H *85/04*
U.S. Cl. 337—159 **15 Claims**



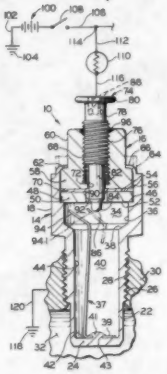
1. A fusible element for use in an electric fuse, said fusible element comprising an elongated element formed of cadmium and a metallic coating having a thickness between 0.1 and 10 microns and covering substantially the entire exterior surface of said elongated element for effectively prohibiting pre-melting deterioration including sublimation, corrosion, mechanical fatigue and fretting of said elongated element, said metallic coating being substantially non-porous and being formed of a metal having a melting temperature greater than the melting temperature of cadmium and which does not significantly diffuse into the bulk of the cadmium element and is selected from a group consisting of nickel, iron, aluminum, chromium, manganese, and beryllium.

4,413,247

THERMALLY RESPONSIVE ELECTRICAL SWITCH MEANS AND METHOD OF MANUFACTURE

Charles J. Hire, Mansfield, Ohio, assignor to Hi-Stat Manufacturing Co., Inc., Lexington, Ohio

Filed Feb. 12, 1982, Ser. No. 348,589
Int. Cl.³ H01H *37/28*
U.S. Cl. 337—368 **25 Claims**



1. An electrical switch assembly, comprising switch housing means, said switch housing means comprising a housing portion molded of dielectric material, a passageway extending through said housing portion, at least a portion of the axial length of said passageway comprising an internal thread integrally molded as to be an integral part of said housing portion, an electrically conductive contact means, an external thread carried by said electrically conductive contact means, said electrically conductive contact means being received by said passageway as to have said external thread in cooperative engagement with said integrally molded internal thread, and friction generating means operatively engaging said electrically conductive contact means, said friction generating means being effective to exert a frictional force against said electrically conductive contact means as to resist without preventing the threadable adjustment of said electrically conductive contact means relative to integrally molded internal thread.

4,413,248

LOW FUEL PRESSURE MONITOR FOR INTERNAL COMBUSTION ENGINE

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Fond du Lac, Wis.

Filed Dec. 31, 1980, Ser. No. 221,625
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—52 R **3 Claims**

1. A low fuel pressure monitor for a two cycle engine having an operating piston initially cooled by pressurized fuel, comprising

a speed sensor connected to sense the operating speed of said engine,

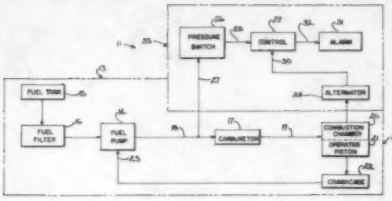
a pressure sensor connected to sense the fuel pressure supplied to said engine,

a connecting circuit connected to an engine driven alterna-

tor provided by said speed sensor to provide a series of pulses having a frequency proportional to engine speed,

a timing circuit to operate from a first condition providing a disable signal to a second condition providing an enable signal in response to a decrease in fuel pressure for a predetermined period of time,

an integrator connected through a gate circuit to operatively respond to said enable signal and said frequency proportional pulses to provide a varying D.C. output proportional to the frequency of said pulses, and



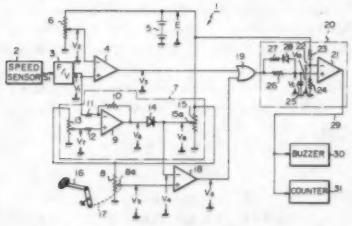
an oscillator connected to said integrator to operate from a non-oscillating condition to an oscillating condition in response to a predetermined D.C. output indicative of a decrease in fuel pressure and an operating speed above a predetermined magnitude to operatively provide a signal indicating a condition where said operating piston may become over-heated in response to a decrease in fuel pressure and an operating speed above a predetermined magnitude.

4,413,249

VEHICLE FUEL-EFFICIENCY WARNING DEVICE

Yoshio Ohtani, Higashimatsuyama; Michio Wakiya, Yoshimi, and Todomu Kakishima, Kamifukuoka, all of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1982, Ser. No. 359,852
Claims priority, application Japan, Mar. 23, 1981, 56-04073
Int. Cl.³ G01M *15/00*
U.S. Cl. 340—52 R **8 Claims**



1. A vehicle fuel-efficiency warning device used for a vehicle driven by an internal combustion engine, comprising:

means for generating a first signal showing a rotational speed being related to an engine speed of said internal combustion engine;

means responsive to said first signal for producing a first detecting signal when said rotational speed exceeds a predetermined upper limit speed;

means for generating a second signal related to the position of a member for adjusting the amount of fuel supplied to said internal combustion engine;

means for generating a third signal corresponding to an upper limit characteristic of the position of said member, said upper limit characteristic including a portion having a decrease tendency in accordance with the increase of said revolutional speed;

means responsive to said second and said third signals for producing a second detecting signal when the position of said member exceeds the upper limit of the position of said member determined by said third signal; and

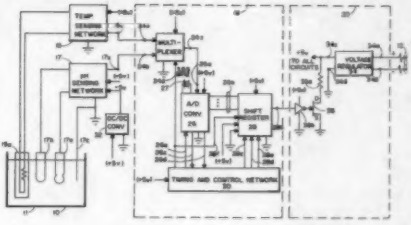
means for issuing a warning in response to the occurrence of said first and or said second detecting signals.

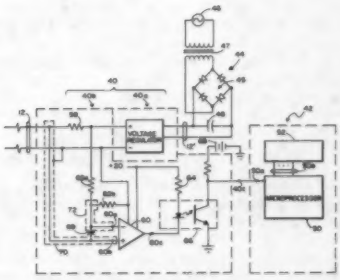
4,413,250

DIGITAL COMMUNICATION SYSTEM FOR REMOTE INSTRUMENTS

Ronald G. Porter, Anaheim; Richard E. LeBlanc, Orange, and Rolf W. Siemon, Brea, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 3, 1981, Ser. No. 298,870
Int. Cl.³ G08C *19/02*; H04B *3/60*; H04Q *9/00*
U.S. Cl. 340—310 A **18 Claims**





1. In a communication system for communicating data from a remote station to a central station, in combination,

(a) a power distribution line for supplying d-c operating power from the central station to the remote station,

(b) a first voltage regulator at the central station for applying a regulated d-c voltage to the power distribution line,

(c) a second voltage regulator at the remote station for providing a regulated d-c station operating voltage from the voltage and current applied thereto over the power distribution line, said second voltage regulator being of the type which draws an approximately constant d-c operating current,

(d) transmitting means connected to the output of the second voltage regulator to modulate the current flowing in the power distribution line in accordance with a digital signal to be transmitted to the central station, said transmitting means having a first state in which it draws a first predetermined current from said output and a second state in which it draws approximately no current from said output,

(e) signal receiving means at the central station for producing a digital signal that varies in accordance with the modulated current in the power distribution line,

(f) whereby the operating voltage of the remote station re-

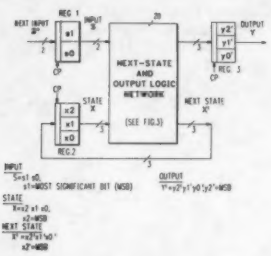
mains approximately constant during the operation of the transmitting means.

4,413,251

METHOD AND APPARATUS FOR GENERATING A NOISELESS SLIDING BLOCK CODE FOR A (1,7) CHANNEL WITH RATE ⅔

Roy L. Adler; Martin Hassner, and John P. Moussouris, all of Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 16, 1981, Ser. No. 283,758
Int. Cl.³ H03K *13/00*
U.S. Cl. 340—347 DD **3 Claims**



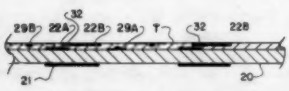
1. An encoder for producing a run length limited (RLL) code for use in a structurally constrained environment having a minimum of 1 and a maximum of seven 0's between adjacent 1's and a coding rate ⅔, said encoder comprising means for receiving as an input vector for a given encoding operation two new message bits (S) and a three bit state vector (X) derived from the immediately preceding encoding operation, logic circuit means for producing a channel vector (Y') obeying said RLL coding rules and a next state vector (X') which becomes the state vector (X) for use in the next encoding operation wherein the vectors Y' and X' are functions of all five input bits to the encoder logic circuit means.

4,413,252

CAPACITIVE SWITCH AND PANEL

Hugh J. Tyler, Santa Ana, Calif., and William H. Conway, Midlothian, Va., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 114,596, Jan. 23, 1980, which is a continuation of Ser. No. 932,086, Aug. 8, 1978, abandoned. This application Mar. 21, 1980, Ser. No. 132,390
Int. Cl.³ G06F *3/02*; H01H *1/06*
U.S. Cl. 340—365 C **2 Claims**



1. A user, touch actuable capacitive switch panel for changing the level of an output signal to an electrical circuit means comprising: a first dielectric panel having a plurality of external, user touchable capacitive plates formed thereon arranged as a keyboard;

a second flexible dielectric panel having a plurality of pairs of internal capacitive plates formed thereon affixed to said first dielectric panel, two internal capacitive plates forming each pair of capacitive plates being oppositely disposed from one of said external capacitive plates on opposite sides of said second flexible dielectric panel forming a plurality of capacitive switches on said switch panel;

electrically conductive paths formed on said second flexible dielectric panel for interconnecting said internal capacitive plates to said electrical circuit means;

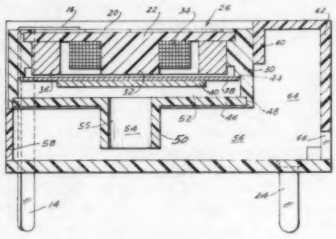
and trim means formed on said second flexible dielectric panel for adjusting the change of level of the output signal upon actuation of each of said capacitive switches.

4,413,253

MINIATURE SOUNDER WITH DOUBLE TUNED CAVITY

Alan Hofer, Wantaugh, and Frank M. Yama, Massapequa, both of N.Y.

Filed Feb. 19, 1981, Ser. No. 236,001
Int. Cl.³ G08B *3/10*
U.S. Cl. 340—388 **4 Claims**



1. A miniature sounder comprising:

a diaphragm;

a surrounding rectangular housing disposed about said diaphragm;

a chamber within said housing having a first open end closed by said diaphragm and an opposite open end communicating with the interior of said housing;

an armature affixed to said diaphragm;

a magnetic circuit operatively connected to said armature for driving said diaphragm at a desired frequency;

said chamber and said housing being dimensioned so that each occupies a volume tuned to said desired frequency for driving said diaphragm so that said chamber resonant frequency comprises a multiple of said diaphragm driving desired frequency and a multiple of said housing resonant frequency and said diaphragm and chamber extend from one wall of said housing to a partial partition, and a pocket is defined between said partition and an opposite wall of said housing and an outlet opening is provided in said housing opposite wall.

4,413,254

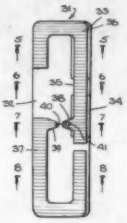
COMBINED RADIO AND MAGNETIC ENERGY RESPONSIVE SURVEILLANCE MARKER AND SYSTEM

George G. Pinneo, Fort Lauderdale, and Jon N. Weaver, Boca Raton, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Sep. 4, 1981, Ser. No. 299,304
Int. Cl.³ G08B *13/24*
U.S. Cl. 340—572 **15 Claims**

1. A marker comprising in combination first passive means including at least one conductive antenna element and being responsive to the energy in a field of radio waves when immersed therein for reradiating a portion of said energy as a detectable and distinguishable radio signal, and second passive means including at least one body of high permeability and low coercivity material and being responsive to the energy in a field of low frequency electromagnetic waves when immersed therein for reradiating a separately detectable signal, both said

passive means being united in a common tag structure with said antenna element and said body of high permeability material



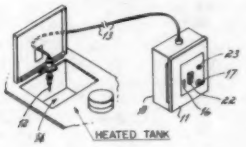
interrelated for independent electrical operation in spite of electromagnetic coupling therebetween.

4,413,255

FLUID LEVEL INDICATOR

Sherman E. Cohen; Dario Ramazzotti, both of Atlanta, and Michael D. Hartley, Roswell, all of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Jun. 12, 1981, Ser. No. 273,098
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—622 **5 Claims**



1. A level indicator for heated glue in a hot melt glue tank which includes a heater for heating the glue comprising:

a thermistor positioned in the tank intermediate its top and bottom;

a thermistor controller coupled to the thermistor and operable to produce a first output when the thermistor is below an operating temperature for the heated glue and to produce a second output when the thermistor is at or above the operating temperature;

an indicator;

a relay coupled to the thermistor controller and to a source of power and operable to become latched in an energized condition by the source of power in response to said second output and operable when latched to couple the indicator to the energizing source of power when the thermistor controller produces the first output; and

a switch for permitting unlatching the relay by decoupling the relay from the source of power.

4,413,256

DRIVING METHOD FOR DISPLAY PANELS

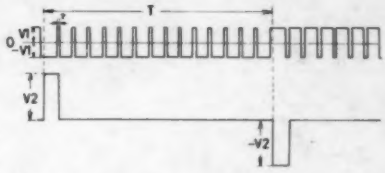
Shuhei Yasuda; Katsubumi Koyanagi; Yutaka Ishii, and Tomio Wada, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1981, Ser. No. 236,582
Claims priority, application Japan, Feb. 21, 1980, 55-21129
Int. Cl.³ G09G *3/36*
U.S. Cl. 340—784 **2 Claims**

1. A display device comprising:

a dynamic scattering mode liquid crystal structure including at least one first display electrode oriented in a first direction and a plurality of second display electrodes oriented in a second direction;

means for supplying said plurality of second display electrodes with a plurality of scanning signals of sequentially shifted phases with polarity inverted at a predetermined interval of time;



means for supplying said first display electrode with frame signals indicative of information to be displayed and having polarity inverted at said predetermined interval; and

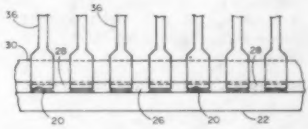
means for adding a plurality of pulse signals having a pulse width shorter than the pulse width of said scanning signals to said frame signals.

4,413,257

CONDUCTIVE PARTICLE LEAD TERMINATION FOR AN ELECTRO-OPTIC DISPLAY

Gordon Kramer, Huntington Beach; Elias J. Lara, Elsinore, both of Calif., and Andrew F. Wollmann, Chandler, Ariz., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 13, 1981, Ser. No. 282,673
Int. Cl.³ G08B *5/00*
U.S. Cl. 340—815.01 **9 Claims**



1. An electro-optic display comprising:

a pair of plates in face-to-face relation forming a sealed envelope;

means within said envelope responsive to exterior addressing electronics for selectively displaying visible characters through a viewing window of said envelope;

means for connecting said addressinng electronics with said displaying means; and

an adhesive composition for supporting said connecting means on at least one of said plates, said adhesive composition having conductive particles to provide electrical interface between said connecting means and said displaying means, said particles having a dimension such that no electrical connection exists between adjacent connecting means of said display.

4,413,258

INTERCONNECTION FOR LOCAL AREA CONTENTION NETWORKS

Roy F. Quick, Jr., and John E. Spracklen, both of San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

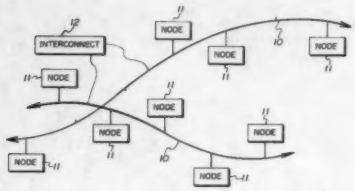
Filed Dec. 14, 1981, Ser. No. 330,714
Int. Cl.³ H04J *3/02*; H04Q *9/00*
U.S. Cl. 340—825.5 **10 Claims**

1. In a system of local area contention networks including a plurality of channels, each channel having a plurality of stations coupled thereto for transmission thereon, and an inter-

connection means for connecting said plurality of channels, each station being adapted to sense its corresponding channel for activity when it is ready to transmit, wait a random period of time and, then, begin transmission if there is still no activity on said channel, said interconnection means comprising:

a pair of output drivers each coupled to one of said channels;

a pair of input receivers each coupled to one of said channels;



latch means to set the input receiver from one of said channels for transmission to the output driver for the other of said channels for transmission from said one channel to said other of said channels; and

detection means to detect when transmission is received from the other of said channels while transmission is being received from said one of said channels and to cause each of said output drivers to place a jamming signal on the respective channels to block transmission.

4,413,259

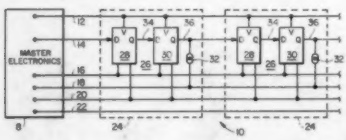
CASCADE MONITORING APPARATUS

Michael A. Lutz, San Carlos; Howard B. Kroymann, Menlo Park; Abdul M. Tayeb, San Leandro, and Edward H. Softky, Menlo Park, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 18, 1981, Ser. No. 303,327

Int. Cl.³ G08B *19/00*; H04Q *9/14*

U.S. Cl. 340—825.06 **6 Claims**



1. An apparatus for monitoring a value of at least one physical parameter at a plurality of points, comprising:

a plurality of monitoring modules, each module having a logic section and a transducer section associated therewith, wherein

the logic sections are connected in series and identical in their response to a logic signal, wherein

each logic section activates its associated transducer section upon receipt of the logic signal, and

each logic section sequentially passes the logic signal to the next module; and

each activated transducer transmits a continuous electrical signal in response to and in correspondence with the physical parameter sensed, for continuously monitoring changes in the parameter sensed;

master electronics for sending an initial logic signal to the module to which it is connected and utilizing the continuous electrical signal for monitoring purposes;

the master electronics including a clock circuit for generating a clock pulse for timing the transfer of the logic signal through each module, and

means for electrically interconnecting the modules to each other and the master electronics.

4,413,260

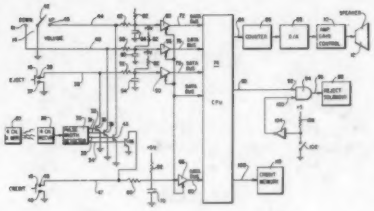
REMOTE-CONTROL SYSTEM FOR COIN-OPERATED PHONOGRAPHS

Lawrence Siegel, Chicago; Edward L. Polanek, Woodstock; Anthony J. Miller, Skokie, and Alan L. Woodman, Mount Prospect, all of Ill., assignors to Stern Electronics, Inc., Elk Grove Village, Ill.

Filed Aug. 31, 1981, Ser. No. 297,990

Int. Cl.³ H04Q *9/00*; H04B *1/32*

U.S. Cl. 340—825.25 **3 Claims**



1. A remote-controlled phonograph which comprises:

a volume control switch that is manually-operable;

an amplifier with gain control;

a multi-channel receiver adapted for receiving modulated carrier signals, said multi-channel receiver including one channel corresponding to a first modulated carrier signal representing lower volume and a second channel corresponding to a second modulated carrier signal representing higher volume, each of said modulated carrier signals comprising a pulse-width modulated carrier signal;

detector means connected to said receiver for detecting said modulated carrier signals, said detector means comprising a pulse-width detector;

a transmitter for transmitting a plurality of modulated carrier signals;

switch means coupled to said detector means and operable in response to detection of predetermined modulated carrier signals, said switch means comprising a separate switch for each modulated carrier signal, each switch being operable to aid in controlling a selected parameter;

volume control means coupling said switch means to said amplifier to vary the gain of said amplifier in response to operation of said switch means, said volume control means comprising gating means coupling both said switch means and said manually-operable volume control switch to said amplifier;

said gating means comprising a separate gate for each modulated carrier signal; and means for providing an enable signal for each gate.

4,413,261

CODED CONTROL FOR VEHICLE ENGINE IGNITION CIRCUIT

Melvin B. Greenberg, North Miami Beach, Fla., assignor to Arthur F. Glaeser, Deerfield Beach, Fla.

Filed Apr. 2, 1981, Ser. No. 250,121

Int. Cl.³ H04Q *7/00*; F02N *11/12*

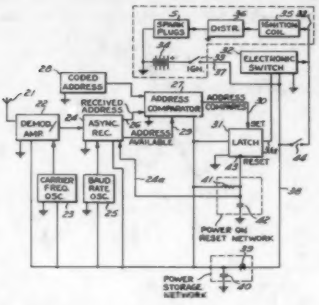
U.S. Cl. 340—825.72 **12 Claims**

1. A coded control system for a vehicle engine ignition circuit comprising:

a radio transmitter operative to broadcast at a selected carrier frequency, a source of a digital coded address, means in said transmitter for modulating said carrier with the bits of said coded address sequentially at a predetermined baud rate;

a radio receiver responsive only to said selected carrier frequency modulated at said predetermined baud rate only to recover said digital coded address broadcast by the transmitter;

comparator means operatively coupled to said receiver to compare the received digital coded address with a stored digital coded address;



and means operatively coupled to said comparator means for enabling said ignition circuit to start the vehicle engine when said received coded address matches said stored coded address.

4,413,262

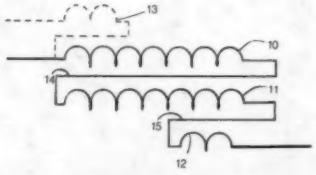
MULTIPLE FREQUENCY TUNED CIRCUIT

Robert H. Johns, 3379 Papermill Rd., Huntingdon Valley, Pa. 19006

Continuation-in-part of Ser. No. 249,440, Mar. 31, 1981, Pat. No. 4,334,228, which is a continuation-in-part of Ser. No. 222,241, Jan. 2, 1981, Pat. No. 4,335,386, which is a continuation-in-part of Ser. No. 162,928, Jul. 17, 1980. This application Dec. 4, 1981, Ser. No. 327,359

Int. Cl.³ H03H *7/00*; H01Q *1/00*

U.S. Cl. 343—722 **4 Claims**



1. A circuit having more than one resonant frequency comprising

a main bifilar winding of two capacitively coupled wire coils with an electrical cross-connection between opposite ends of said main coils, the turns of said coils being insulated from one another and one coil located outside the other,

a third coil having fewer than half the turns of wire than either of said main coils, capacitively coupled to one of said main coils near an end thereof, with an electrical cross-connection between the end of the main coil to which the third coil is capacitively coupled and the opposite end of said third coil.

4,413,263

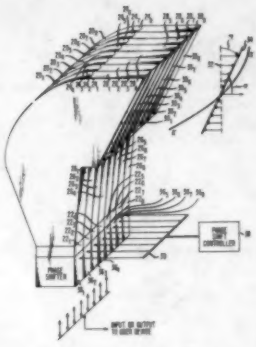
PHASED ARRAY ANTENNA EMPLOYING LINEAR SCAN FOR WIDE ANGLE ORBITAL ARC COVERAGE

Noach Amitay, Tinton Falls, and Michael J. Gans, Monmouth Beach, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1981, Ser. No. 272,751

Int. Cl.³ H01Q *3/36, 19/20, 15/24*

U.S. Cl. 343—756 **7 Claims**



1. A phased array antenna arrangement comprising:

a plurality of feed elements (**20, 62, 70**) arranged in a linear array and capable of launching or receiving a planar wavefront at an aperture of the array; and

phase shifting means (**36**) for selectively producing a predetermined linear plane taper along a first axis across the aperture of the array characterized in that

the aperture of the linear array formed from the plurality of feed elements is cut at a predetermined bias angle (α) to a ray directed from the center of the aperture to the center of the field of view of the antenna arrangement to produce a fixed linear phase taper along a second axis of the aperture of the array orthogonal to the first axis thereof to produce a predetermined squinted beam, the predetermined bias angle producing a beam which traverses a predetermined arc (A'—A') when linearly scanned along the first axis.

4,413,264

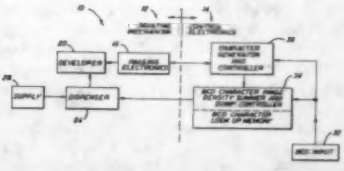
PRINT MATERIAL SUPPLY CONTROL APPARATUS AND METHOD

Antonio S. Cruz-Uribe, Cobalt, and Peter C. Di Giulio, Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 11, 1982, Ser. No. 338,691

Int. Cl.³ G03G *15/00*

U.S. Cl. 346—1.1 **1 Claim**



1. A method for controlling the amount of print material supplied to an electronic printer, the steps comprising: supplying information relative to a text to be printed, storing the text information, operating a printer to reproduce the text in response to the stored text information, performing a statistical

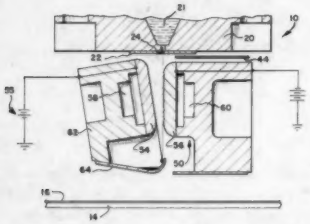
study of the expected character usage, determining the amount of print material required to print each type of character, determining the amount of print material required to print the text information stored based upon the number of characters to be printed and the weighted average of the amount of print material required per characters, and supplying print material to the printer in accordance with the amount determined.

4,413,265

INK JET PRINTER

Barry C. Kockler, Lewisville; Theodore S. Geiselman, Plano, and Gerda N. Black, Garland, all of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,799
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **11 Claims**



1. In an ink jet printer, having a print head defining a plurality of orifices from which fluid filaments emerge to break up into jet drop streams, said jet drop streams being arranged in a row and directed toward a print receiving medium transport, a charge plate including a plurality of open sided charge electrodes for selectively charging drops in said jet drop streams, a deflection electrode positioned to one side of said row of jet drop streams between said print head and said print receiving medium transport, means for supplying an electrical deflection potential to said deflection electrode, and a catcher positioned between said print head and said print receiving medium transport, the method of initiating printer operation, comprising the steps of:

(a) initiating operation of said print head to produce a plurality of said jet drop streams, while maintaining said charge plate in a position remote from said jet drop streams, and while maintaining said catcher in a full catch position between said print head and said print receiving medium transport and extending a substantial distance to either side of said row of jet drop streams so as to catch the drops in said jet drop streams,

(b) translating said charge plate toward said row of jet drop streams into a position such that said charge electrodes partially surround associated fluid filaments at the points of break up to provide shielding thereof,

(c) applying said electrical deflection potential to said deflection electrode so as to produce a deflection field while utilizing said charge electrodes to shield said jet drop streams from said field,

(d) pivoting said catcher into an operating position in which deflected drops strike said catcher while charging said drops sufficiently to deflect said drops to said catcher, and

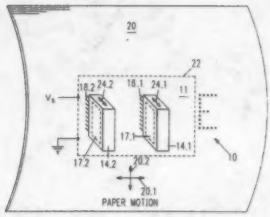
(e) initiating selective charging of said drops in said jet drop streams by selective application of charge potentials to said charge electrodes, whereby selected drops may be deflected to strike a print receiving medium carried by said print receiving medium transport.

4,413,266

METHOD AND APPARATUS FOR ERASING INK JET PRINTING

Ari Aviram, Yorktown Heights, N.Y.; Zalata Kovac, Holzgerlingen, Fed. Rep. of Germany, and Robert A. Myers, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,299
Int. Cl.³ G01G *15/16*
U.S. Cl. 346—21 **6 Claims**



1. In an ink jet printer wherein ink droplets are utilized to form indicia on a paper medium, the improvement comprising:

said ink is based on an azo dye; and

means for selective erasure of said indicia including:

means for chemically reducing said indicia in a selected area on said paper medium;

means for warming said indicia in said selected area to enhance the erasure of said indicia by said reducing means; and

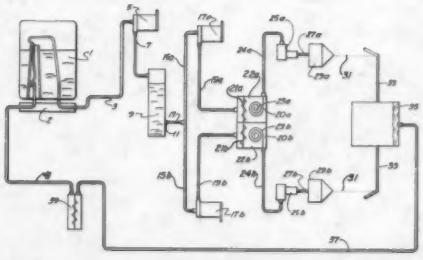
means for neutralizing said area to establish said area in condition again to receive ink droplets forming other indicia.

4,413,267

INK SUPPLY SYSTEM FOR INK JET PRINTING APPARATUS

Richard A. Hein, Rochester, Mich., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Dec. 18, 1981, Ser. No. 332,041
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **12 Claims**



1. In liquid ink supply system for an ink jet printing apparatus which discharges ink drops from a print head toward a record receiving member, selectively utilizes some of said ink drops for printing desired symbols on said second receiving member, the remainder of said emitted ink drops not impinging upon said record receiving member, but being collected by a catcher means, said liquid ink supply system being provided with a primary reservoir for said ink, and conduit means for connecting said primary reservoir with said print head, the improvement comprising:

a first pump connected by said conduit means intermediate said primary reservoir and said print head;

an intermediate reservoir connected by said conduit means intermediate said first pump and said print head; and

a second pump connected by said conduit means intermediate said intermediate reservoir and said print head.

4,413,268

JET NOZZLE FOR AN INK JET PRINTER

Horst Bentin, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,877

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048259

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**

1. A jet nozzle plate for an ink jet printer, comprising a plurality of substantially cylindrical jet nozzles each having a discharge orifice, the plane of the orifice being perpendicular to the longitudinal axis of the jet nozzle, the orifice being surrounded by a nozzle brim having sharp edges, the width of the nozzle brim being between 0 and 20 um, a trough (6) being provided around the jet nozzle brim.

4,413,269

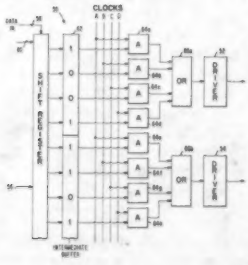
METHOD OF AND APPARATUS FOR CONTROLLING GRAY SCALE WHILE PRINTING ON CHARGE SENSITIVE RECORDING MEDIUMS

Joseph P. Pawletko, Endwell, and Charles R. Pigos, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,843

Int. Cl.³ G01D *15/06*; H04C *15/34*

U.S. Cl. 346—154 **12 Claims**



1. Apparatus for controlling the intensity of a pixel which is to be printed by an electrode on a charge sensitive recording medium, over a write cycle having a predetermined number of equal subdivisions and duration, in a matrix printer having a plurality of print electrodes and driving circuits therefor, said apparatus comprising:

(a) storage means for receiving and storing coded multibit words that represent pixel intensity data for said electrodes;

(b) first circuit means for generating a predetermined number of intensity clock signals of equal amplitude, said number of clock signals being equal to the number of bits in said intensity coded words with each clock signal being associated with a different one of said bits, each of said intensity clock pulse signals including a different number of write cycle subdivision pulses, the positive going portions of which pulses correspond in width to the subdivisions of said write cycle; and

(c) second circuit means, connected to said first circuit means to receive said intensity clock signals, to said storage means to receive said coded intensity words and to said print electrode driving circuits, for generating a write pulse waveform in response to receipt of said intensity words and said intensity clock pulse signals for each of said print electrode driving circuits and electrodes.

4,413,270

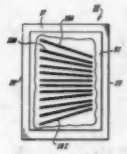
MULTIGATE LIGHT VALVE FOR ELECTRO-OPTIC LINE PRINTERS HAVING NON-TELECENTRIC IMAGING SYSTEMS

Robert A. Sprague, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,057

Int. Cl.³ G01D *15/14, 9/42*; G02F *1/01*

U.S. Cl. 346—160 **9 Claims**



5. An electro-optic line printer comprising

a multigate light valve,

a photosensitive recording medium which advances in a cross line direction relative to said light valve,

non-telecentric imaging optics for imaging said light valve onto said recording medium, said imaging optics having a predetermined entrance pupil, and

means for illuminating said light valve with a light beam which converges toward said entrance pupil with a predetermined angle of convergence.

4,413,271

INTEGRATED CIRCUIT INCLUDING TEST PORTION AND METHOD FOR MAKING

Walter S. Gontowski, Jr., Thompson, Conn., and James F. Mayrand, Shrewsbury, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Mar. 30, 1981, Ser. No. 248,142

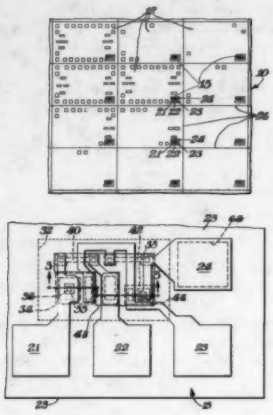
Int. Cl.³ H01L *27/04*

U.S. Cl. 357—40 **8 Claims**

8. An integrated circuit wafer consisting essentially of a matrix of crystalline semiconductor integrated circuit blocks, each of said blocks being comprised of (a) at least a plurality of bipolar transistors, a plurality of resistors interconnected to form the principal circuit thereof; (b) a plurality of metal pads on said block being connected to and providing electrical access to various points, respectively, of said principal circuit; (c) a separate test circuit including:

one bipolar transistor having been formed all together simultaneously with at least some of said plurality of transistors; and

one resistor having been formed simultaneously with at least some of said plurality of resistors; and



said one transistor and said one resistor of said test circuit being formed in only one electrically isolated pocket of said each semiconductor block.

4,413,272

SEMICONDUCTOR DEVICES HAVING FUSES

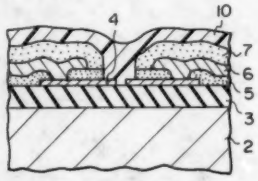
Hirohiko Mochizuki, Tokyo; Masao Nakano, Kawasaki; Fumio Baba, Yokohama; Tomio Nakano, Kawasaki, and Yoshihiro Takemae, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 3, 1980, Ser. No. 183,734

Claims priority, application Japan, Sep. 5, 1979, 54-122908[U]

Int. Cl.³ H01L *23/52*; G11C *17/00*

U.S. Cl. 357—65 **18 Claims**



1. A semiconductor device having a fuse comprising:

a semiconductor substrate;

an isolating layer formed on said semiconductor substrate;

fuse material formed on said isolating layer in a predetermined pattern;

an insulating layer formed over said fuse material and over said isolating layer and shaped so as to provide windows over end portions of said fuse material;

conductor material deposited in a predetermined shape over said insulating layer and through said windows to contact said fusing material; and

a protective layer formed over said conductor material and said insulating layer, and shaped so as to provide a window to the middle portion of said fuse material,

an additional protective layer covering at least said window to the middle portion of said fuse material, and formed after said fuse material has a gap formed therein.

4,413,273

SYSTEM FOR MIXING TWO COLOR TELEVISION SIGNALS

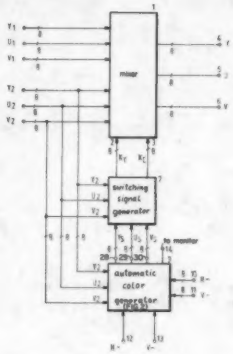
Gerhard Wischermann, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 307,381

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037779

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—22 **8 Claims**



1. A system for mixing two colour television signals in dependence upon the colour of one of at least two colour television signals

wherein said one signal is designated a foreground signal comprising

a mixing circuit (1) for the at least two colour television signals,

a switching signal generator (7) connected to and controlling the operation of the mixing circuit,

wherein the foreground signal is compared with a reference signal,

and further comprising

means (9; FIG. 2) for deriving the said reference signal from the foreground signal including means (15, 17; 19, 20) for sampling the foreground signal at a point corresponding to a selected position on an image of the foreground signal

means for storing the sampled value; and

means (28, 29, 30) for controlling the switching signal generator by the sampled, stored values.

4,413,274

COLOR SYNCHRONIZING CIRCUIT

Nobukazu Hosoya, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 3, 1981, Ser. No. 299,117

Claims priority, application Japan, Sep. 11, 1980, 55-127583

Int. Cl.³ H04N *9/50*

U.S. Cl. 358—25 **39 Claims**

1. A color synchronizing circuit included in a color process circuit for processing a composite color signal including a color signal and a color burst, an including phase locked loop means having a given pull-in range,

said phase locked loop means including

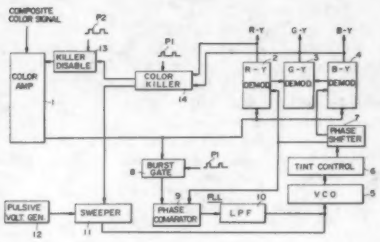
voltage controlled oscillator means responsive to a given control voltage for generating a color subcarrier signal, said voltage controlled oscillator means being structured such that a frequency variable range (Δf) is in a predetermined relation ($\Delta f < \pm f_H$) with respect to a repetition frequency (f_H) of said color burst,

phase comparator means responsive to an intermittent color

burst and the output of said voltage controlled oscillator means for comparing the phases thereof, and

control voltage generating means responsive to the output of said phase comparator means for providing said control voltage of said voltage controlled oscillator means, said color synchronizing circuit comprising

pull-in range defining means provided in association with said phase locked loop means for defining said pull-in range of said phase locked loop means in a predetermined range, and



control voltage changing means provided in association with said phase locked loop means for forcedly changing said control voltage,

said control voltage changing means comprising

sawtooth waveform voltage generating means for generating a sawtooth waveform voltage and

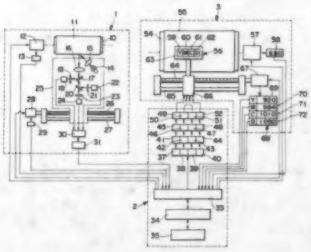
means for providing said sawtooth waveform voltage from said sawtooth waveform voltage generating means to said voltage controlled oscillator means in superimposition on said control voltage.

4,413,275

INK-JET COLOR PRINTING APPARATUS

Hideo Horiuchi, and Kazutaka Yoshida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 3, 1981, Ser. No. 317,850
Claims priority, application Japan, Dec. 15, 1980, 55-175764
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **15 Claims**



1. An ink-jet color printing apparatus for forming a color picture in the form of dot patterns with ink dots of a plurality of colors on a recording medium comprising:

means for converting into digital signals the color image information of a picture element to be reproduced;

memory means for memorizing said digital signals of the color image information;

means for recording said digital signals from said converting means into said memory means;

image processing means for masking said digital signals of the color image information;

support means for supporting a said record medium thereon;

head assembly means closely adjacent said recording medium, said head assembly means including at least a group of ink-jet heads for ejecting yellow ink drops, a group of ink-jet heads for ejecting magenta ink drops and a group of ink jet heads for ejecting cyan ink drops arranged in a row extending transversely of the direction of advance of said recording medium so as to form dot matrices on a plurality of lines to be scanned thereby;

two-dimension scanning means for scanning the surface of said recording medium by a continuous motion of said head assembly relative to said recording medium and an intermittent motion of said head assembly relative to said recording medium in the direction perpendicular to that of said continuous motion;

means to cause said continuous and intermittent motions by a motion of said head assembly or recording medium;

detecting means for detecting positions of said head assembly relative to said recording medium in the direction of said continuous motion to generate first signals;

a plurality of detecting means for detecting positions of said groups of ink-jet heads, respectively, in the direction of said intermittent motion to generate second signals;

information read-out means for reading the color image information of picture elements on at least three scanning lines to be simultaneously painted out from said memory means corresponding to said second signals; and

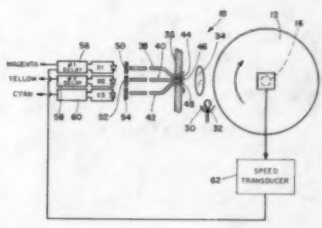
means for each group of ink-jet heads to convert color density signals of a single color of ink drops to be ejected by said ink-jet heads extracted from said color image information into analog signals and to feed said analog signals to said ink-jet heads corresponding to said first signals in order to drive them.

4,413,276

OPTICAL SCANNER FOR COLOR FACSIMILE

Carl H. Hertz, Skolbanksvagen 8, and Jan O. Nilsson, Stora Sodergatan 63B, both of Lund, Sweden

Filed Nov. 16, 1981, Ser. No. 321,825
Int. Cl.³ H04N *1/04*
U.S. Cl. 358—75 **8 Claims**



1. An optical scanner for scanning an image and providing separate color outputs comprising:

a plurality of optical fiber light collectors, there being a separate optical fiber collector associated with each of said color outputs, each light collector collecting light from a discrete area of the image which is distinct from areas associated with other light collectors at each instant of scan;

a lens for imaging the image onto the end faces of the optical fiber collectors;

means for detecting and providing an electrical output of the amount of light of a respective color collected by each optical fiber light collector;

means for causing relative movement between the optical fiber light collectors and the image; and

means for correlating the electrical outputs as a function of the speed of relative movement between the optical fiber

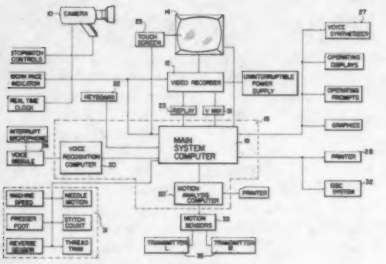
light collectors and the image to associate respective colors with each discrete area of the image.

4,413,277

INSTANT REPLAY PRODUCTIVITY MOTIVATION SYSTEM

John M. Murray, Monroeville, Ala., assignor to Instant Replay Systems, Evergreen, Ala.

Filed Jan. 23, 1981, Ser. No. 227,600
Int. Cl.³ H04N 7/18
U.S. Cl. 358—93 19 Claims



1. A method for communicating information relating to a study of the work method of an operator performing a task composed of one or more elemental steps, comprising the steps of:

making a video recording of the operator performing the task;

measuring the elapsed time for performing each elemental step;

simultaneously making a video recording of the measured elapsed times; and

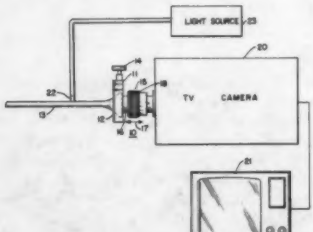
instantly replaying the video recording on a video monitor with a plurality of displays of elapsed time relating to the individual elemental steps of the work task upon completion of the work task.

4,413,278

OPTICAL COUPLING APPARATUS FOR COUPLING AN ARTHOSCOPE TO A CAMERA

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,409
Int. Cl.³ H04N 7/18
U.S. Cl. 358—93 10 Claims



1. An optical coupler apparatus comprising:

a clamp section comprising a housing having a first large aperture on a first surface and second smaller coaxial aperture on a second surface with said apertures communicating, a pair of semicircular clamp members located on said housing and positioned about said large aperture and means for selectively moving said clamp members in and out of said large aperture,

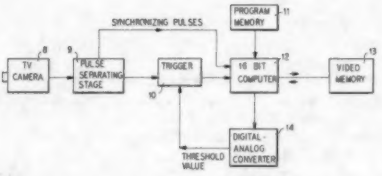
a focusing section coupled to said housing at said second surface to surround said smaller aperture, said focusing section having a first cylinder for slideably accomodating a lens, said first cylinder having a slot on a surface thereof, a second cylinder moveably positioned about said first cylinder and through said slot coupling said second cylinder to said lens to allow said lens to move to accomodate focusing and means coupled to said focusing section to accomodate a camera.

4,413,279

METHOD FOR CONTACT-FREE DETERMINATION OF QUALITY FEATURES OF A TEST SUBJECT OF THE MEAT GOODS CLASS

Reinhard Görl, Neusass, Fed. Rep. of Germany, assignor to Pfister GmbH, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 330,935
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047490
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 10 Claims



1. A method for contact-free determination of quality features of a meat goods test subject by determining a proportional fat-meat ratio of a carcass half, comprising the steps of: illuminating the test subject and scanning its image by a video camera, the meat tissue and fat tissue being distinguished from one another according to a measure of relative brightness of the corresponding tissues; digitizing brightness signals created by the camera observing the image of the sample by comparing the brightness signals with a discrimination-typical threshold value corresponding to a brightness determined such that all brighter and all darker tissue parts respectively deviating above and below the threshold value are represented as white or approximately white image parts and as black or approximately black image parts; establishing the discrimination-typical threshold value as a value which is substantially independent of a background brightness associated with the test subject and so as to solely distinguish between brightness signals of the meat tissue only; and the establishment of the discrimination-typical threshold value is carried out in the following steps

(a) optically scanning the sample linewise with a black-white camera against a dark background and storing a sharply emerging contour thereby arising at a brightness transition from background to sample as a vertical line forming a step function defined in a brightness verses image location x/y diagram and where said step function lies parallel to the Y-axis plotting brightness;

(b) brightness values of the brightest part "P_h" and of the darkest part "P_d" are determined from image points at both ends of the step function and are converted into numerical values according to the brightness scale at the Y-axis, and calculating from these numerical values a first threshold value of the brightness "S_1" according to the equation

$$S_1 = 0.5 \times (P_h + P_d);$$

(c) shifting the calculated first threshold value S_1 in a direc-

tion of increasing brightness along the Y-axis until the step function changes into a finite function $y=n\ x$ due to sloping of the brightness curve away from the vertical; and

(d) digitizing the real image into a black-white image by use of the newly established threshold value of the brightness.

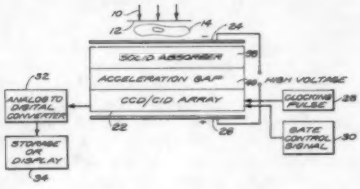
4,413,280
X-RAY IMAGING APPARATUS

Joseph K. Adlerstein, Kew Gardens; Heinz F. Nitka, Binghamton, both of N.Y.; Charles S. Naiman, Brookline, and Aryeh Weiss, Cambridge, both of Mass., assignors to Xyram Corporation, Tuckahoe, N.Y.

Filed Apr. 1, 1981, Ser. No. 249,909

Int. Cl.³ H04M *5/32*

U.S. Cl. 358—111 **16 Claims**



1. An X-ray imaging apparatus for use with a source of X-radiation, said apparatus comprising an array of charge-storing means, a medium interposed between a body under observation and said charge-storing means for converting X-radiation passing through the body and through said medium to a corresponding pattern of electrical charges, said array of charge-storing means being located proximate to said medium for storing said pattern of electrical charges, means for accelerating said electrical charges from said medium onto said charge-storing means, means coupled to said charge-storing means for developing an output electrical signal corresponding to said stored electrical charges, and means coupled to said signal-developing means for applying said output signal to an output utilization device.

4,413,281
METHOD FOR SIMULTANEOUS TELETEXT AND ANALOG SIGNAL TRANSMISSION

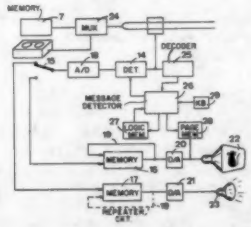
Paul Thonnart, Liege, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi, Brussels, Belgium

Filed Jun. 26, 1981, Ser. No. 277,672

Claims priority, application European Pat. Off., Jul. 1, 1980, 80200623

Int. Cl.³ H04N *7/08*

U.S. Cl. 358—147 **7 Claims**



1. A process for the transmission of information over television networks comprising:

(a) generating analog signals representing groups of scans of an image, each of said scans having a duration approximately equal to the time necessary to transmit one scan of a television image;

(b) generating first identifying messages and combining them with the analog signals representing said scans;

(c) generating teletext signals in digital form, said teletext signals being associated with said groups of scans;

(d) generating second identifying messages and combining them with said teletext signals;

(e) selecting analog signals identified by said first identifying messages and associated teletext signals identified by said second identifying messages and transmitting both approximately at the same time;

(f) receiving said analog and teletext signals with a receiver responsive to said first and second identifying messages;

(g) decoding said analog and associated teletext signals; and

(h) reproducing said decoded analog and associated teletext signals for one of simultaneous or successive reproduction.

4,413,282
TELEVISION GHOST SIGNAL DETECTION DURING THE VIDEO INFORMATION INTERVAL

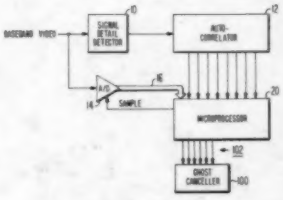
Robert A. Wargo, Ringoes, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,434

Claims priority, application United Kingdom, Apr. 6, 1981, 8110693

Int. Cl.³ H04N *5/21*

U.S. Cl. 358—167 **14 Claims**



1. A method for detecting ghost signal contamination of a video signal comprising the steps of:

a. detecting a video signal comprising an active video vertical scanning interval and a vertical retrace interval;

b. processing said video signal during said active video interval to produce signals indicative of the times of occurrence of transitions of said video signal during said active video interval; and

c. measuring the time intervals between said signals indicative of said transitions of said video signal during said active video interval; and

d. determining when the recurrence of one of said time intervals between said transitions of said video signal becomes statistically significant to identify the presence of ghost signal contamination.

4,413,283
SOLID-STATE IMAGING DEVICE

Masakazu Aoki, Kodaira; Haruhisa Ando, Hachioji; Shinya Ohba, Kanagawa, and Iwao Takemoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,933

Claims priority, application Japan, Dec. 26, 1980, 55-186391[U]

Int. Cl.³ H04N *3/14*

U.S. Cl. 358—213 **9 Claims**

1. A solid-state imaging device comprising:

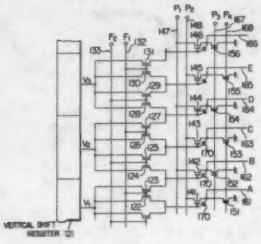
a photosensing unit having a plurality of picture elements arranged in a matrix form, each of said picture elements

including a photo-electric conversion element and a switching insulated gate field effect transistor for reading an optical signal from said photo-electric conversion element;

vertical gate lines each connected to the gates of the switching insulated gate field effect transistors for the picture elements on the same row;

a vertical shift register for producing vertical scan pulses;

a simultaneous two-line selection circuit for simultaneously



selecting two of said vertical gate lines to simultaneously read the two lines; and

a buffer circuit inserted between said vertical gate lines and said simultaneous two-line selection circuit for first turning off the vertical gate line for the picture element row which has a coupling capacitance with only one of the two selected vertical gate lines and thereafter turning off the gate vertical line for the picture element row which has coupling capacitances with the two selected vertical gate lines.

4,413,284

NOISE REDUCER FOR A SOLID STATE IMAGER

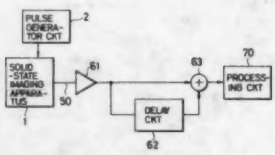
Morishi Izumita, Inagi; Toshiyuki Akiyama, Kodaira; Kazuhiro Sato, Tokyo, and Shusaku Nagahara, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1981, Ser. No. 336,322

Claims priority, application Japan, Jan. 21, 1981, 56-6403

Int. Cl.³ H04N *3/15, 5/21, 9/07*

U.S. Cl. 358—213 **5 Claims**



1. In a solid-state imaging apparatus wherein photo signal outputs of a plurality of photosensors arrayed in horizontal and vertical directions are read out onto vertical signal lines through a first group of switches which are driven by vertical scanning pulses and wherein the photo signal outputs on the respective vertical signal lines are fetched onto an output line through a second group of switches which are driven by horizontal scanning pulses; a solid-state imaging apparatus characterized by comprising a delay circuit which delays the output from said output line a period that is shorter than one horizontal scanning period by approximately a duration of one horizontal scanning pulse, and an adder which adds an output of said delay circuit and said output of said output line, an output of said adder being delivered as a video signal.

4,413,285

FACSIMILE APPARATUS

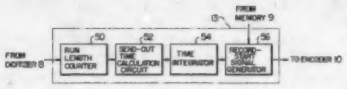
Masayasu Anzai, Hitachi; Kiyohiko Tanno, Katsuta; Hideo Hirane, Hitachi; Akira Shimada, Hitachi, and Masaharu Tadauchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,899

Claims priority, application Japan, Sep. 24, 1980, 55/131518

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—260 **7 Claims**



1. A facsimile apparatus having a transmitting unit for scanning an image of a text to produce an image information signal and converting the image information signal to a coded information signal in a band compressed transmission system for transmission through a transmission line, and a receiving unit for decoding the coded information signal transmitted through the transmission line to reproduce the image information on a recording medium, said facsimile apparatus comprising:

memory means for storing the information signals representing the image of the text to be transmitted and received, said memory means having a memory capacity of at least one page information of said text;

said transmitting unit comprising:

photo-electric conversion means for converting optical information obtained by scanning the image of the text into an electric information signal;

first clock generating means for generating a timing clock for reading out the electric information signal from said photo-electric conversion means; and

first converting means for converting the electric information signal read out from said photo-electric conversion means in response to the output from said first clock generating means to the coded information signal to be transmitted through the transmission line;

said receiving unit comprising;

second clock generating means for generating a timing clock for reading out the received information signal stored in said memory means;

second converting means for converting the information signal read out from said memory means into analog information signals;

scanning type recording means for feeding said recording medium at a constant speed and recording the image on said recording medium in accordance with the analog information signal read from said second converting means;

first switch means selectively changed over between a first state where the output of said second clock generating means is allowed to be applied to said memory means and a second state;

second switch means selectively changed over between a first state where the output of said first clock generating means is allowed to be applied to said photo-electric conversion means and a second state where the output of said second clock generating means is allowed to be applied to said photo-electric conversion means when said first switch means is in the second state;

third switch means selectively changed over between a first state where the output of said second converting means is allowed to be applied to said recording means and a second state where the output of said photo-electric conversion means is allowed to be applied to said recording means;

said facsimile apparatus operates as a facsimile when each of

said first, sacond and third switch means is in said first state and

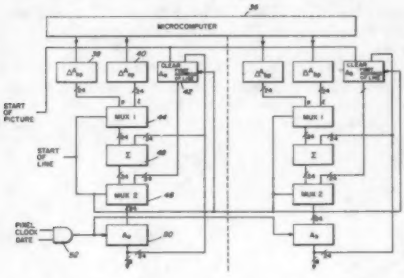
said memory means is responsive to the timing clock from said second clock generating means to sequentially read out the information signal such that a scanning-start timing at each scanning line in said recording means is repeated with a constant period; and

said facsimile apparatus operates as a copying means for recording the image information signal obtained at the transmitting unit on the recording medium at the receiving unit thereof and said photo-electric conversion means is responsive to the timing clock from said second clock generating means to sequentially read out the information signal such that a scanning-start timing at each scanning line in said recording means is repeated with a constant period.

4,413,286
METHOD AND APPARATUS INVOLVING DIGITAL SCREEN GENERATION

William T. Boston, Melrose, Mass., assignor to Optronics International, Inc., Chelmsford, Mass.

Filed Aug. 24, 1981, Ser. No. 295,573
Int. Cl.³ H04N *1/40, 1/22*
U.S. Cl. 358—283 **9 Claims**



1. A method of reproducing an image comprising the steps of:

(a) scanning an image to be reproduced;

(b) generating first optical density values at selected address locations of said scanned image;

(c) generating a screen cell having a selected optical density pattern with second optical density values at selected address locations, a map of said second optical density values having a sinusoidal profile;

(d) repeating said screen cell in first and second directions to form a large area screen having a repetition of said second optical density values at selected address locations;

(e) comparing said first and second optical density values at corresponding address locations; and

(f) generating output data signals representing said comparison and defining a reproduction of said image to be reproduced.

4,413,287
WHITE LINE SKIPPING

John D. Torpie, Dallas; Robert F. Lozen, Denton, and Shing-Chang R. Hsieh, Richardson, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

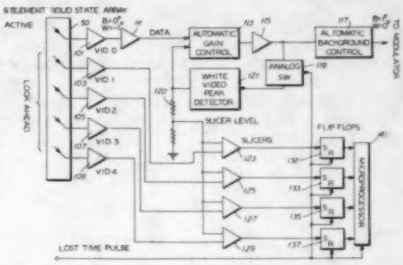
Filed Apr. 14, 1982, Ser. No. 368,258
Int. Cl.³ H04N *1/17, 1/40*
U.S. Cl. 358—288 **8 Claims**

1. A white line skipping system for use in data reduction in a facsimile transmission system, wherein the improvement is characterized by:

optical detector array means (50) including an element for detecting the active data during a single scan line and a plurality of look ahead elements for detecting only the presence of data along a plurality of scan lines,

video processing means (52) for receiving the active data from said optical detector array means and processing said data into an acceptable video signal,

mircoprocessor means (54) for receiving and sampling the look ahead data and generating enabling signals depending on the combination of look ahead data lines which have and do not have video information thereon,



frequency generator means (58) responsive to said enabling signals from said microprocessor means (54) for generating a predetermined frequency signal for each of said combination of look ahead lines containing video information,

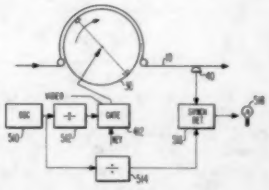
means (56) for modulating the video signals as processed by said video processing means, and

switch means (60) for transmitting either said modulated video signals or said predetermined frequency signals.

4,413,288
INDICATOR CONTROL SIGNAL GENERATOR FOR VIDEO TAPE RECORDER

Robert N. Hurst, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,438
Int. Cl.³ G11B *27/36*
U.S. Cl. 360—31 **8 Claims**



1. A helical scan television video tape recorder comprising:

a headwheel;

a recording transducer mounted on said headwheel;

coupling means coupled to a source of television signals and to said recording transducer for enabling transduction;

tape transport means adapted for driving a magnetic tape along a tape path past said headwheel at a first rate for presenting unrecorded tape portions for recording;

headwheel drive means coupled to said headwheel for driving said headwheel at a second rate for translating said transducer at a rate allowing high video frequencies to be transduced;

a playback transducer arranged adjacent said tape path for transducing signals from the tape during recording by said recording transducer; and

frequency-sensitive detection means coupled to said play-

back transducer for responding to recorded signals for producing a record-indicating signal;

wherein the improvement comprises;

signal generating means coupled to said recording transducer for recordation of a signal having a preselected frequency characteristic; and

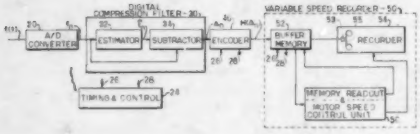
frequency-changing means coupled to said signal generating means and to said detection means for changing the frequency of the signal of said signal generating means and for applying the frequency-changed signal to said detection means.

4,413,289

DIGITAL RECORDING AND PLAYBACK METHOD AND APPARATUS

Charles S. Weaver, Palo Alto, and Joseph H. Chadwick, Menlo Park, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 13, 1981, Ser. No. 243,593
Int. Cl.³ G11B *5/09, 5/00*
U.S. Cl. 360—51 **24 Claims**



1. In a digital recording system for recording a bit stream in which bits occur at a varying bit rate on a recording medium with a high and substantially constant bit density, the combination comprising

buffer memory means for temporarily storing said bits to be recorded,

variable speed recording means for recording bits from said buffer means on a recording medium, and

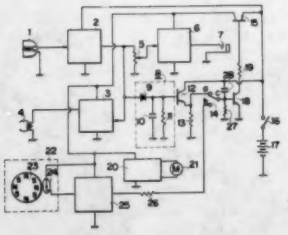
means responsive to the number of bits contained in said buffer memory means for continuously controlling both the rate at which bits are read from said buffer memory means to said recording means and the speed of said recording means for recording said varying bit rate stream with a substantially constant high bit density on said recording medium.

4,413,290

TAPE RECORDER WITH A VOICE SIGNAL RESPONSIVE CIRCUIT

Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 116,763, Jan. 30, 1980, abandoned. This application May 24, 1982, Ser. No. 381,466
Claims priority, application Japan, Feb. 2, 1979, 54-012542
Int. Cl.³ G11B *15/02, 19/02*
U.S. Cl. 360—69 **7 Claims**



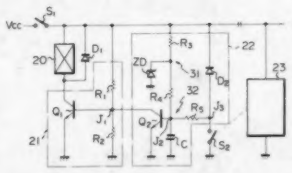
1. A tape recorder for use with a power source comprising a tape recorder circuit; a motor circuit; an on-off switch that connects or disconnects the power source; a semiconductive switching circuit arranged to be enabled but otherwise unactuated in response to the on-off switch; a sound actuating circuit responsive directly to the on-off switch and, on the basis of sound input received, actuates and deactuates the motor circuit and starts and stops the recorder circuit; an auto-off circuit arranged to be enabled in response to both said on-off switch and said switching circuit being on for detecting tape travelling to its end and for producing a stop signal to stop the operation of the recorder circuit and motor circuit; and a switching arrangement that serves to actuate the semiconductive switching circuit in response to one of the sound actuating circuit and the auto-off circuit so that either said sound actuating circuit can turn the switching circuit on and off or said auto-off circuit can turn the switching circuit off.

4,413,291

CASSETTE TAPE PLAYER-RECORDER

Yoshiharu Ueki, and Shouzaburou Sakaguchi, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 28, 1981, Ser. No. 306,399
Claims priority, application Japan, Sep. 29, 1980, 55-135617
Int. Cl.³ G11B *15/00*
U.S. Cl. 360—71 **4 Claims**



1. In a cassette tape player-recorder of slot-in type which includes a cassette receiving tunnel opened through a cassette insertion slot to the outside, a carriage movable in said tunnel for carrying a cassette inserted into said tunnel through said cassette insertion slot, a carriage control mechanism connected to said carriage for actuating said carriage so as to position said cassette at an operable or inoperable position, a tape advancing mechanism for advancing a recording tape contained in said cassette when said cassette is placed at said operable position, a head positioning mechanism for positioning a magnetic head relative to said recording tape, and a controller for controlling said tape advancing and head positioning mechanisms so as to perform predetermined modes of operation, the improvement comprises:

first detecting means placed within said cassette receiving tunnel, for detecting the insertion of a cassette into said tunnel;

second detecting means for detecting that said cassette is placed at said operable position;

a reset signal generator connected to said first and second detecting means, for producing a reset signal when a time longer than a predetermined period lapses from the insertion of said cassette into said tunnel until said cassette is positioned at said operable position;

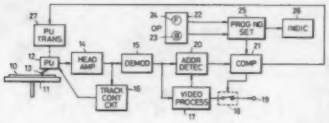
a cassette eject controller connected to said carriage control mechanism for ejecting said cassette in response to said reset signal.

4,413,292

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS CAPABLE OF PERFORMING AUTOMATIC SEARCH REPRODUCTION

Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryuzo Abe, both of Yokohama; Yasuhiro Yuza, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 28, 1981, Ser. No. 287,823
Claims priority, application Japan, Jul. 29, 1980, 55-103998
Int. Cl.³ G11B *17/00, 27/28*
U.S. Cl. 360—72.2 **5 Claims**



1. An apparatus for reproducing a rotary recording medium in which an information signal comprising a plurality of programs and an address signal for identifying each program by a number are recorded, said reproducing apparatus comprising:

reproducing means for reproducing said information signal and said address signal from said rotary recording medium;

detection means responsive to said reproducing means for detecting said address signal from signals reproduced by said reproducing means;

setting means for setting a program number of a program which is to be reproduced after an automatic searching operation;

transferring means for transferring said reproducing means in forward and backward directions across said rotary recording medium; and

comparing means responsive jointly to said reproducing means and said setting means for comparing the program number set in said setting means with an address of a program of the information signal being reproduced by said reproducing means, and for producing and supplying a search signal to said transferring means so that said reproducing means is transferred in a direction which makes the program and address coincide, said comparing means producing a signal to initiate a reproduction of a predetermined mode from the beginning of the program identified by the program number set in said setting means when the program number coincides with the address,

said setting means having a first manipulation part for setting a program number of the program being reproduced when operated once and setting a program number of a previous program which is (N-1)-programs before the program being reproduced when operated N-times, where N is an integer which is greater than or equal to two, a second manipulation part for setting a program number of a program which is M-programs after the program being reproduced when operated M-times, where M is an integer, and means for memorizing the program numbers which are set by said first and second manipulation parts.

4,413,293

MAGNETIC TAPE TRANSPORT

Richard A. Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 17, 1981, Ser. No. 255,127
Int. Cl.³ G11B *5/08, 5/10, 15/00*
U.S. Cl. 360—85 **12 Claims**

1. A magnetic tape transport for the automatic threading and replay of cassette-mounted tapes produced upon a recorder having a first-speed rotating head and guide assembly around which the tape is helically wrapped in a substantially 360-degree omega path, said replay transport being characterized in that:

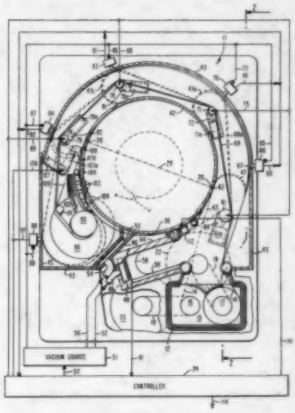
a two-headed rotating head and guide drum assembly is provided having substantially twice the diameter of said first-speed assembly;

means are provided for driving the two-headed assembly at substantially half the rotational speed of said first-speed assembly;

means are provided for mounting said cassette adjacent to said two-headed assembly;

threading means are provided for pulling a loop of tape from said mounted cassette and for extending said loop in a threading path to form a helical wrap around a substantially 180-degree sector of said two-headed drum; and

means are provided to be operable at a predetermined length of said loop to ensure separation of the opposite shanks of said loop during a threading mode of the transport, and to become inoperable for such separation during a de-threading mode of the transport;



said shank separating means including a plurality of retractable guides each having a retracted position remote from said threading path of said loop, and an operating position on said path and between the shanks of said loop;

said guides being positioned along said loop-threading path in spaced relation such that in said operating positions thereof the radially outer shank of tape from guide to guide, during the operating mode, is spaced at all points away from the guide drum and from the radially inner shank in contact with the drum; and

said shank separating means also includes means for causing each of said guides to move from retracted to operating position sequentially as said tape loop passes the guide during the threading mode, but also causing all of said guides to retract simultaneously at the beginning stage of said de-threading mode.

4,413,294

MECHANISM FOR CONTROLLING THE DISPLACEMENT OF A POSITIONER CONE RELATIVE TO A FLOPPY DISC

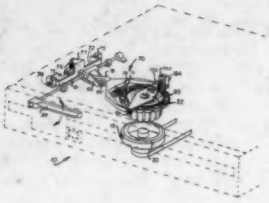
Gene Beijer, Los Angeles, Calif., assignor to Magnum Division of Tandon Corporation, Chatsworth, Calif.

Filed May 4, 1981, Ser. No. 259,914
Int. Cl.³ G11B *5/016, 17/02, 25/04*
U.S. Cl. 360—99 **15 Claims**

1. A mechanism for controlling the lowering and clamping of a positioner cone device onto a floppy disc and associated spindle, comprising:

a pivotable assembly having a free end coupled to support

the positioner cone device in pivotable relationship relative to an axis perpendicular to the direction of lowering;
guide means coupled to the positioner cone device for controlling the attitude of the device relative to the pivot axis during lowering; and



means including overtravel means engaging the pivotable assembly and spring means coupled to the pivotable assembly for shifting the pivotable assembly when lowered against the floppy disc to act against the spring force and effect spring clamping of the positioner cone device against the floppy disc and spindle.

4,413,295

MAGNETIC HEAD

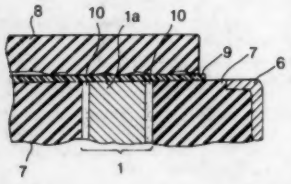
Hiroaki Kato, Machida; Junji Hamana, Chichibu; Akeo Sakai, Yokoze; Yoshio Kawakami, Chichibu; Atsushi Goto, Hanno; Saichiro Amano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of Japan

Continuation of Ser. No. 230,107, Jan. 29, 1981, Pat. No. 4,368,496, which is a continuation of Ser. No. 14,849, Feb. 26, 1979, abandoned. This application Apr. 28, 1982, Ser. No. 372,556

Claims priority, application Japan, Mar. 1, 1978, 53-23221; Mar. 7, 1978, 53-25611; Jan. 23, 1979, 54-7321

Int. Cl.³ G11B *3/08, 5/08*

U.S. Cl. 360—110 **6 Claims**



1. A magnetic head, comprising:
a head core including a plurality of core halves joined to each other, each of said core halves comprising at least one thin plate of predetermined thickness composed of a high-magnetic permeability material and at least two adhesive layers adhered to and solidified on opposing surfaces of said plate, said adhesive layers being composed of an electrically insulative resin and fine inorganic granular particles of a material harder than said high magnetic permeability material, said particles being added to said resin in an amount of from 20 to 70 percent by weight of said resin such that said adhesive layers have a higher degree of abrasion resistance than said plate, the thickness of said adhesive layers being in a range of from one-hundredth to one-thirtieth said predetermined thickness of said plate;
a coil wound on said head core;
a case enclosing said head core and coil; and
a fixing material for enclosing said head core and said coil within said case, said fixing material comprising a second resin mixed and solidified with a powder chosen from the group consisting of powdered SiO_2 and powdered alumina and said fixing material having a degree of hardness intermediate the relatively low degree of hardness of said high-magnetic permeability material and the relatively high degree of hardness of said adhesive layers, such that the hardness of the fixing material approximates the average hardness of the plate and adhesive layers in composite and such that said plate, said adhesive layers and said fixing material all abrade at a substantially uniform rate,
whereby degradation of performance due to uneven abrasion of said plate, said layers, and said fixing material is mitigated.

4,413,296

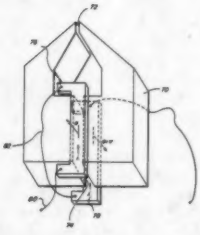
THIN FILM MAGNETORESISTIVE HEAD

Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 57,619, Jul. 16, 1979, Pat. No. 4,306,215, which is a continuation-in-part of Ser. No. 23,433, Mar. 23, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,186

Int. Cl.³ G11B *5/30*

U.S. Cl. 360—113 **3 Claims**



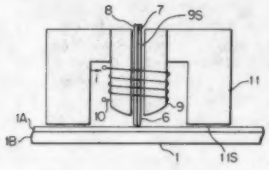
1. A magnetic head comprising:
(a) first and second pole pieces disposed with respect to each other so as to form front and back non-magnetic gaps therebetween, said front gap being a transducer gap disposed to coact with a magnetic recording medium,
(b) first and second electrically conductive thin single domain magnetic film means secured to opposing sides of said pole pieces at said back gap, said thin magnetic film means being so disposed with respect to said pole pieces and said back gap that flux bridges said back gap via said thin magnetic film means,
(c) said first thin magnetic film means having first and second electrical contacts respectively for receiving and exiting electrical current therein, the easy axis of said first thin magnetic film means being canted relative to the current flow path between said first and second contacts, and
(d) said second thin magnetic film means having first and second electrical contacts respectively for receiving and exiting electrical current therein, the easy axis of said second thin magnetic film means being (1) canted relative to the current flow path between the first and second contacts of said second thin magnetic film means, and (2), substantially parallel to the easy axis direction of said first thin magnetic film means,
the current path in said second thin magnetic film means being parallel to the current path in said first thin magnetic film means, whereby flux entering the front gap of said head causes the magnetoresistances of said thin magnetic film means to vary inversely.

4,413,297

MAGNETIC RECORDING AND PLAYBACK APPARATUS OF PERPENDICULAR RECORDING TYPE

Motoharu Tanaka, Numazu; Hazime Machida, Tokyo, and Hiroshi Kobayashi, Kodaira, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,330
Claims priority, application Japan, May 23, 1980, 55-68527
Int. Cl.³ G11B 5/30
U.S. Cl. 360—119 20 Claims



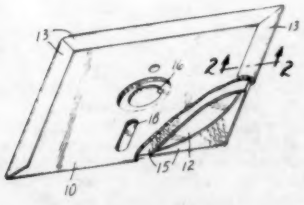
1. A magnetic recording and playback apparatus adapted to record information in a recording surface of a magnetic record medium in a perpendicular orientation thereto; the apparatus comprising a main pole having a magnetic axis adapted to be disposed normal to a recording surface of the record medium, an auxiliary pole disposed in surrounding relationship with the main pole and having a small clearance from the lateral side thereof, a coil disposed around the auxiliary pole for recording information into the record medium and for detecting a change in a magnetic flux produced in the record medium, and a yoke having its one portion connected to the auxiliary pole and another portion of a relatively large area disposed opposite to a recording surface of the record medium, an end of the main pole being disposed in contact with the surface of the record medium while the yoke being disposed at a given distance from the surface of the record medium.

4,413,298

DISKETTE JACKET

Roger L. Pecsok, Cottage Grove; Ray G. McCrea, Jr., Stillwater, and Craig F. Lamphere, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 5, 1981, Ser. No. 260,709
Int. Cl.³ G11B 23/02
U.S. Cl. 360—133 8 Claims



1. An opaque diskette jacket comprising

biaxially-oriented polyester film containing discrete, uniformly-distributed polymeric particles having an average diameter of 5 to 100 micrometers and comprising 5 to 30% by volume of the polyester film to provide a matte finish,

an adhesive layer covering the inner face of the film, and

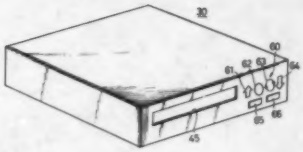
a wiping fabric bonded by the adhesive layer to the inner face of the film.

4,413,299

STATE INDICATING DEVICE IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryuzo Abe, both of Yokohama; Yasuhiro Yusa, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 29, 1981, Ser. No. 287,986
Claims priority, application Japan, Jul. 29, 1980, 55-107290[U]
Int. Cl.³ G11B 5/82, 19/10
U.S. Cl. 360—137 5 Claims



1. A state indicating device in an apparatus for reproducing a rotary recording medium having recorded signals, said medium being accommodated within a space in a case, a jacket having an opening through which said rotary recording medium can enter or leave, and a lid plate inserted through the opening of said jacket to close said opening, said reproducing apparatus having an inserting opening through which said case is inserted, a turntable for rotating said rotary recording medium, lid plate locking means and rotary recording medium clamping means respectively provided at the innermost part of said reproducing apparatus opposite to said inserting opening with respect to said turntable, lowering and raising means for lowering and raising said rotary recording medium between a position clamped by said clamping means and a position on said turntable, reproducing means for reproducing recorded signals from said rotary recording medium, and transferring means for transferring said reproducing means over said rotary recording medium, said state indicating device comprising:

first display means for indicating a state when it is possible to insert said case into said reproducing apparatus;

second display means for indicating a reproduction stand-by state in which said rotary recording medium is placed onto said turntable within said reproducing apparatus;

third display means for indicating a reproducing state in which said rotary recording medium is being reproduced by said reproducing means;

fourth display means for indicating a state when it is possible to recover said rotary recording medium from outside of said reproducing apparatus, said recovery being accomplished by inserting an empty jacket into said reproducing apparatus to accommodate said rotary recording medium within said jacket; and

detecting and driving means for detecting the states of said reproducing apparatus and for selectively driving the displays of said first through fourth display means,

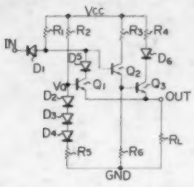
said detecting and driving means having a first switch for detecting that said lid plate is at a position in which it may be locked by said lid plate locking means, a second switch for detecting that said case or said jacket has been inserted into said inserting opening, a third switch for detecting the position of said reproducing means, a fourth switch for detecting the operational state of said lowering and raising means, and a circuit for detecting the state of said reproducing apparatus according to the detection state of said first, second, third, and fourth switch, to produce and supply a display signal to one of said first through fourth display means.

4,413,300

LINE DRIVER CIRCUIT HAVING A PROTECTIVE CIRCUIT AGAINST EXCESS CURRENTS

Hideji Sumi, Yokohama, and Masayuki Kokado, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 13, 1981, Ser. No. 310,974
Claims priority, application Japan, Oct. 13, 1980, 55-142603
Int. Cl.³ H02H *3/08*
U.S. Cl. 361—98 **13 Claims**



1. A line driver circuit having a protective circuit against excess currents, comprising:

an outut port;

an emitter-follower circuit having an output connected to said output port and provided in an output stage of said line driver circuit;

protective means, including a protective transistor having a base, for limiting the output current of said emitter-follower circuit;

detecting means for detecting the output current of said emitter-follower circuit; and

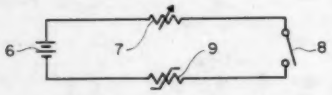
pull-up means, including a pull-up transistor which is turned on when the voltage detected by said detecting means exceeds a first predetermined value, that is, when a potential at said output port is lowered to a level lower than a second predetermined value, for pulling up the base potential of said protective transistor to turn on said protective transistor, the base potential of said protective transistor being pulled up until the potential at said output port exceeds said second predetermined value.

4,413,301

CIRCUIT PROTECTION DEVICES COMPRISING PTC ELEMENT

Lee M. Middleman, Portola Valley, and Frank Doljack, Pleasanton, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 21, 1980, Ser. No. 141,987
Int. Cl.³ H02H *5/04, 7/20*
U.S. Cl. 361—106 **24 Claims**



1. An electrical circuit which comprises

(1) a source of electrical power having a voltage of V volts;

(2) a circuit protection device comprising at least two electrodes and a PTC element which has a switching temperature T_s and which comprises a polymer component and, dispersed in said polymer component, a particulate filler component which comprises a conductive filler, each of said electrodes being in the form of a wire or strip which is at least partially embedded in the PTC element so that it has an electrically active surface of generally columnar shape; and

(3) a damageable circuit component which is damaged if the current flowing through it exceeds a value i_{damage} amps for a time t seconds, where t is 30;

said electrical circuit having a normal operating condition in which said device is in a low temperature low resistance stable operating condition and

(A) a current i_n flows through said device;

(B) said device is at a temperature T_{dn} and has a resistance R_{dn};

(C) said device is in contact with a medium which is at a temperature T_n;

(D) a current less than i_{damage} flows through said damageable circuit component; and

(E) there is a stable equilibrium between the rate at which the device generates heat by I^2R heating and the rate at which heat is lost from the device;

said device having an electrical power/temperature relationship and being capable of losing heat at a rate such that if new electrical elements comprising a new power source and a switch are introduced into the circuit or a part of the circuit so that a fault test circuit is created in which, when said switch is closed a test cycle is initiated and,

(a) there is an initial fault current flowing through said damageable circuit component which exceeds i_{damage};

(b) there is an initial fault current flowing through said device which results in a computed current density in the PTC element in the first of the test cycles defined below which reaches a maximum of 1000 amps/inch^2;

(c) said device and said damageable circuit component are in series; and

(d) the sum of the iniital potential drop over said device and the initial potential drop over said damageable circuit component is V_{int}, where V_{int} is at least 120 volts and at least $1.5\times V$;

then if the fault test circuit is subjected to N successive test cycles, where N is 5, in each of which test cycles the switch is closed for 5 seconds, the switch is then opened and the device is allowed to cool to T_{dn} before the next test cycle is carried out, then in each of said test cycles, the result of closing the switch is that the device generates heat by H^2R heating at a rate which exceeds the rate at which heat can be lost from the device, thus causing the resistance of the device to rise rapidly and the current to fall, and thereafter the current through the damageable circuit component reaches a stable value which is less than i_{damage}, the potential drop over the device reches a stable value which is the higher of 150 volts and $1.5\times V$, and the device reaches a high temperature high resistance stable operating condition in which the rate at which the device generates heat by I^2R heating is equal to the rate at which heat is lost from the device; and after said test cycles have been completed, the device has a resistance at T_{dn} which is less than $3\times R_{dn}$.

4,413,302

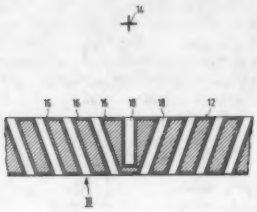
STRUCTURAL MEMBER MADE FROM A METALLIC MATERIAL HAVING AN UPPER SURFACE EXPOSED TO THE DANGER OF ELECTRIC CHARGE BUILDING-UP THEREON AND THE USE OF SUCH STRUCTURAL MEMBER

Uwe Maixner, Barum, and Dieter Milferstaedt, Tespe-Buetlingen, both of Fed. Rep. of Germany, assignors to Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt GmbH, Tesperhude, Fed. Rep. of Germany

Filed Jul. 16, 1979, Ser. No. 57,693
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831791
Int. Cl.³ H01J *43/28*
U.S. Cl. 361—212 **6 Claims**

1. In an electrical apparatus, a structural member having a surface made from an electrically conductive metallic material, said surface being prone to undesired accumulation of electrical charges which degrade the performance of the apparatus, said surface being exposed to a vacuum environment during

operation of the appartus, said surface comprising a layer selected from the group consisting of titanium silicide and



zirconium nitride, said layer being in intimate and direct electrical contact with the metallic material of said surface.

4,413,303

IGNITION SYSTEMS

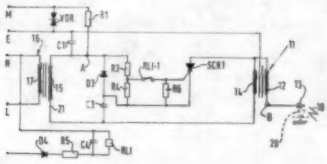
Clifford M. Cheary, Boldmere; David J. Lancaster, Tamworth, and Paul P. Smith, Lichfield, all of England, assignors to Dunlop Limited, London, England

Filed Jun. 23, 1981, Ser. No. 276,539

Claims priority, application United Kingdom, Jul. 5, 1980, 8022109

Int. Cl.³ F23Q *3/00*

U.S. Cl. 361—253 **7 Claims**



1. An electrical igniton system for a burner comprising a spark generation circuit, means for monitoring the production of a spark comprising a capacitor, means for charging said capacitor in one sense by operation of the spark generation circuit, means for monitoring the presence of a flame at a first location comprising means responsive to the flame for producing a charge on said capacitor in the opposite sense to that produced by operation of the spark generation circuit, and means for detecting the presence and polarity of a charge on said capacitor to detect that sparks have been produced and that said flame has been produced.

4,413,304

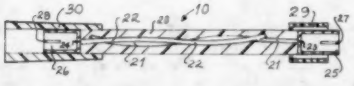
ELECTROMAGNETIC FIELD COMPENSATED CABLE

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 345,939, Feb. 3, 1982, and Ser. No. 282,755, Jul. 13, 1981. This application May 20, 1982, Ser. No. 380,476

Int. Cl.³ F23Q *3/00*; H01Q *1/52*

U.S. Cl. 361—253 **13 Claims**



1. An electromagnetic field compensated cable, comprising the combination of:

an electrically insulating casing; and

means, within said casing and integral with said cable, for effecting cancellation of field components generated by current flow in said cable, said means constituting a twisted pair of electrically insulated wires, said twisted pair having first and second ends, one of said twisted pair being electrically terminated at said first end and unterminated at said second end, the other of said twisted pair being electrically terminated at said second end and unterminated at said first end.

4,413,305

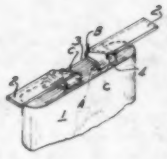
TERMINAL FOR A CAPACITOR AND A METHOD OF FORMING SAME

Cecil W. FitzGerald, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 21, 1982, Ser. No. 390,165

Int. Cl.³ H01G *1/14*; H01R *3/00*

U.S. Cl. 361—306 **8 Claims**



1. In combination with a capacitor of the type having a plurality of layers of foil and insulation wound to form a capacitor and at least one electrically conductive strip projecting beyond an edge of the layers of foil to provide a connecting terminal to an electrical conductor, the improvement wherein said terminal further comprises;

a first fold in said strip in the direction of one of said outside surfaces of said capacitor;

a second fold in said strip in a direction toward another portion of the outside surface of said capacitor; and

a third fold at an oblique angle to an edge of said strip.

4,413,306

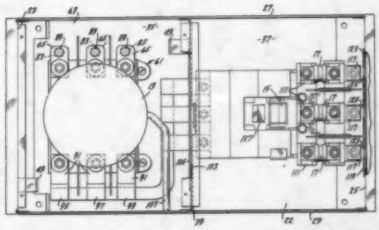
TAMPER PREVENTION HOUSING FOR A WATT-HOUR METER AND OVERLOAD PROTECTED SWITCH

Reuben A. Erickson, Park Ridge, Ill., assignor to Erickson Electrical Equipment Company, Park Ridge, Ill.

Continuation of Ser. No. 401,848, Jul. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 314,687, Oct. 26, 1981, abandoned. This application Jun. 9, 1983, Ser. No. 501,749

Int. Cl.³ H02B *9/00*

U.S. Cl. 361—361 **4 Claims**



1. A tamper prevention housing assembly mounted on a standard polyphase panelboard chassis which contains at least three rigid bus bars extending the length of the panelboard chassis and approximately symmetrically spaced across the width of the chassis and occupying substantially all of the width of the chassis, the housing assembly being adapted to

enclose a polyphase watt-hour meter and overload protected polyphase switch means arranged in a secure sequence between the bus bars of the panelboard chassis and the terminal lugs for the output load, in which the housing assembly does not extend substantially beyond the lateral confines of the panelboard chassis, the housing assembly including:

a rectangular housing having back, side and end walls, the housing being mounted on the panelboard chassis with its back to the chassis,

a security partition extending between two opposed walls of the housing to divide the housing into a meter compartment and a switch compartment,

a polyphase meter socket installed in the meter compartment in asymmetrical alignment relative to the bus bars,

an overload protected polyphase switch means installed in the switch compartment,

a first set of rigid connectors, one for each bus bar, individually electrically connecting the bus bars of the chassis to the meter socket,

each connector of the first set having a different length to connect the bus bars to the meter socket in proper phase relation in its asymmetrical position relative to the bus bars,

a second set of connectors, extending through the first security partition and individually electrically connecting each phase from the meter socket to the switch means,

a removable panel closing the front of the meter compartment and having at least one opening for exposing a meter to view, the removable panel having means to permit securing it in a compartment-closing position against unauthorized displacement or removal,

a hinged door mounted on the front of the switch compartment, and

at least one opening formed in a side wall of the switch compartment to afford access for load connections to the switch means.

4,413,307

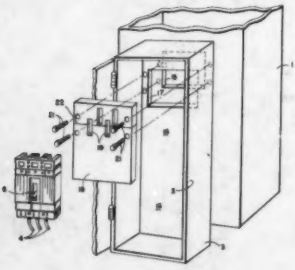
BUS BAR EXTENSIONS TO OUTSIDE OF BUSWAY FOR EXTERNAL CONNECTIONS

Joseph A. Butte, 79 Monte Vista Ave., Watsonville, Calif. 95076; Robert C. Foehn, 139 Lincoln Ave., Sausalito, Calif. 95965, and Conrad C. Grieder, 423 Tehema St., San Francisco, Calif. 94103

Filed Jul. 9, 1981, Ser. No. 281,583

Int. Cl.³ H02B *1/20*

U.S. Cl. 361—378 **5 Claims**



1. In combination with a busway in a building and a plurality of bus bars within and along the height of the busway, local circuits on spaced floors of said buildings, and a hole through a side of said busway at each local circuit,

a feeder connection between each local circuit and said busses comprising:

a local circuit breaker box at each hole,

the wall of each side box adjacent said busway having a hole substantially corresponding to one of the holes in the side of the busway,

a circuit breaker in one of said box,

each said feeder connection comprising connecting lugs having one end welded to each of said bus bars thus becoming an integral part thereof,

the opposite end of said of said lugs protruding through said busway into each said box through said holes and disposed for connection to said circuit breakers inside said box.

4,413,308

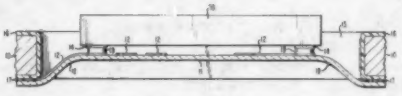
PRINTED WIRING BOARD CONSTRUCTION

Vernon L. Brown, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1981, Ser. No. 297,862

Int. Cl.³ H05K *1/14*

U.S. Cl. 361—398 **17 Claims**



1. A printed wiring board construction comprising an electrical component having a pattern of electrical terminals thereon, a supporting substrate having a planar surface having a recess therein for each of said terminals and corresponding in position to the positions of said terminals in said pattern of terminals, and a flexible sheet carrying printed wiring affixed to said planar surface extending over said recess for each of said terminals, said sheet extending beneath the plane of said surface at said positions of said terminals, said terminals being electrically connected to said printed wiring within said recess for each of said terminals.

4,413,309

PRINTED CIRCUIT BOARD

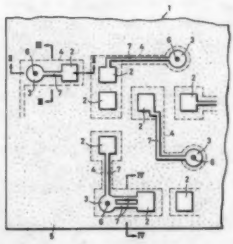
Toshio Takahashi, Tokyo, and Mitsuo Ohsawa, Chigasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,422

Claims priority, application Japan, Jul. 17, 1980, 55/101141[U]

Int. Cl.³ H05K *1/02*

U.S. Cl. 361—406 **4 Claims**



1. A printed circuit board for mounting circuit elements to form an electric circuit thereon, said circuit board comprising:

a substrate, a land covering at least part of said substrate,

a first land portion without piercing hole for connecting with an electrode of a leadless component;

a second land portion with a piercing hole for connecting with the lead wire of an element with leads; and

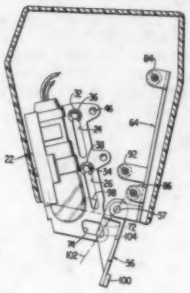
a solder resist pattern leaving an exposed third land portion connecting said similarly exposed first and second land portions for leading melted solder therebetween.

4,413,310

LIGHT ASSEMBLY FOR A SEWING MACHINE

Kenneth D. Adams, Madison, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 16, 1982, Ser. No. 408,383
Int. Cl.³ D05B 79/00
U.S. Cl. 362—90 9 Claims



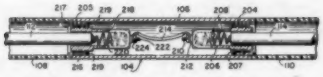
1. In the head end portion of a sewing machine extending over a work supporting bed, a slidable member, a light bulb in a socket which is affixed on the slidable member, and a light transmitting bulb cover at the bottom end of the head end portion of the machine operably connected to said member for moving the member between an elevated position in which the bulb and socket are protected by surrounding structure of the head end portion of the machine and by the bulb cover in a station underlying the bulb, and a lowered position in which the bulb is rendered accessible under the head end portion of the machine for removal and replacement while the socket remains within the head end portion of the machine protected by the surrounding structure.

4,413,311

CONNECTION SYSTEM FOR JOINING ILLUMINATED MODULES

Philip Orenstein, 34-42 12 St., Long Island, N.Y. 11106

Filed Sep. 1, 1981, Ser. No. 298,303
Int. Cl.³ F21S 3/00
U.S. Cl. 362—219 4 Claims



1. A connection system for mechanically and electrically joining a plurality of illuminated modules into a decorative lighting display; such system including:

(a) a plurality of light impervious rigid connectors with hollow tubular bodies,

(b) each module comprising;

(I) a rigid transparent plastic sleeve,

(II) a neon gas filled tube that extends axially through said plastic sleeve,

(III) end caps secured to opposite ends of said plastic sleeve for receiving and retaining the neon filled tube in fixed position,

(IV) electrically conductive members located on said end caps for delivering electrical energy to the neon gas to ignite same, and

(V) means for retaining the end caps in position,

(c) each connector securely receiving an end cap of at least one module therewithin,

(d) electrical leads extending between end caps of adjacent modules,

(e) a source of high voltage power for supplying the electrical leads with sufficient voltage to excite the neon filled tubes and cause decorative, low intensity light to radiate outwardly in all directions through said transparent sleeves, and

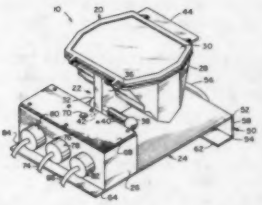
(f) said leads being disposed entirely within the hollow tubular bodies of the light impervious connectors, whereby said leads are completely hidden from view.

4,413,312

PORTABLE, HANGABLE LAMP WITH OUTLETS

Charles E. Morkosky, Sr., and Charles E. Morkosky, II, both of 809 Philadelphia Rd., Joppa, Md. 21085

Filed May 21, 1982, Ser. No. 380,546
Int. Cl.³ F21V 21/26
U.S. Cl. 362—269 6 Claims



1. In a system of high intensity reflector-equipped lamp, base, current input means, current output means, and hanging means, the improvement comprising: means for manually adjusting the angle of the high-intensity reflector-equipped lamp relative to said base, means for preventing burning of the hands during said manual adjusting, said hanging means including means for hanging the system on doors and the like free of twisting when hung; the current output means including a junction box; the means for manually adjusting including: a pivotal connection mounting the high intensity reflector-equipped lamp to the junction box and means for clamping said pivotal connection; the means for preventing burning comprising: a thermally insulative strip on said reflector located for gripping during said manual adjusting, a handle on said base thermally remote from the high-intensity reflector-equipped lamp and located for gripping during said manual adjusting, and said means for clamping having an operative end with a standoff, the standoff locating the operative end away from said high intensity reflector-equipped lamp.

4,413,313

ELECTRICAL INVERTERS

Jeffrey I. Robinson, Bedforshire, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

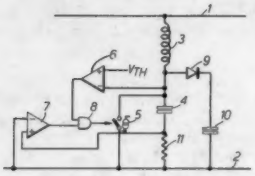
Continuation of Ser. No. 307,351, Sep. 30, 1981. This application Jul. 16, 1982, Ser. No. 399,106
Claims priority, application United Kingdom, Oct. 7, 1980, 8032309
Int. Cl.³ H02P 13/00
U.S. Cl. 363—80 13 Claims

1. An inverter for converting a d.c. electrical supply into an a.c. electrical supply, including:

(i) resonant circuit means for storing electrical energy and for generating sinusoidal electrical oscillations;

(ii) current-limiting switch means capable of being enabled and disabled and when enabled for conducting current up to a set limit and holding the current at the set limit for effecting charging of the resonant circuit with electrical energy from a d.c. electrical supply up to the set current limit;

(iii) control circuit means for monitoring the voltage across the switch means to enable the switch means to charge the resonant circuit periodically in synchronism with and to reinforce oscillations in the resonant circuit only while said voltage lies between first and second limits and is changing in a predetermined sense and to disable the



switch means to stop charging of the resonant circuit when said voltage reaches said second limit consequent to current flow being held at said set limit by said switch means; and

(iv) output circuit means coupled to the resonant circuit for transferring alternating electrical energy to a load circuit when coupled to the output circuit means.

4,413,314

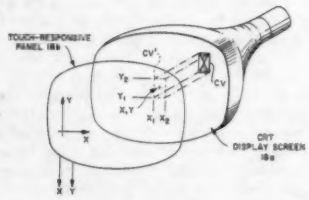
INDUSTRIAL PROCESS CONTROL SYSTEM

Billy R. Slater, Plano; Dennis W. Simpson, Carrollton, both of Tex., and Clarence T. Carroll, Middletown, N.J., assignors to Forney Engineering Company, Addison, Tex.

Division of Ser. No. 159,599, Jun. 16, 1980. This application Apr. 20, 1981, Ser. No. 255,842

Int. Cl.³ G06F *15/46, 3/153*

U.S. Cl. 364—188 **6 Claims**



1. A control system for controlling an industrial process, said system comprising:

a plurality of controlled devices and associated device controllers for effecting control of process parameters, said controlled devices and associated device controllers interconnected through a communications link means to a control interface, said interface including a visual display means having a visual display surface associated therewith and means for generating symbols displayed simultaneously thereon representative of different process parameters of the system, said symbols each having a displayed analog characteristic representing the value of an associated process parameter;

a touch-responsive means overlying said display surface and through which said symbols are visible;

means for detecting the touching of selected target areas on said touch-responsive means corresponding to said displayed symbols, said target areas including a first area located at each symbol for incrementing the associated parameter and a second area located at each symbol separate from said first area for decrementing the associated parameter; and

means for generating a signal in response to the touching of said first area and another signal in response to the touching of said second area, said first signal effective to increment the associated process parameter and the second signal effective to decrement the associated process parameter, the change in said process parameter causing a change in the analog characteristic of the corresponding displayed symbol on said visual display surface.

4,413,315

ADDRESSING SYSTEM

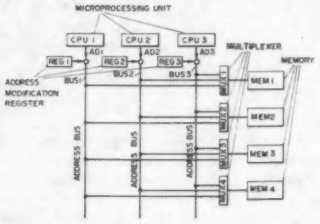
Mitsuo Kurakake, Kokubunji, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 117,992

Claims priority, application Japan, Feb. 5, 1979, 54-12067

Int. Cl.³ G06F *9/36*

U.S. Cl. 364—200 **8 Claims**



1. An addressing system for a computer system having a plurality of processing units operatively connected to corresponding address buses and a plurality of memories, connectable to any of the address buses, for receiving a series of addresses, comprising:

a plurality of address modification registers, one for each of said plurality of processing units; and

a plurality of adders, each of which is operatively connected to a corresponding one of said plurality of address modification registers and operatively connected between one of said plurality of processing units and the corresponding one of said address buses, each of said plurality of processing units providing an address output within a range of address outputs beginning with a leading address, each of said plurality of processing units being capable of providing, as said address output, said leading address, each of said plurality of adders adding together the address output from the one of said plurality of processing units, to which it is operatively connected, and the content of the one of said plurality of address modification registers, to which it is operatively connected, and providing the added output to the one of said address buses corresponding to the one of said plurality of processing units.

4,413,316

DATA PROCESSING SYSTEM FOR PRE-PLANNING THE FLIGHT OF AN AIRCRAFT

William Blue, Balerno; George I. C. Bruce, and Stephen E. Cowles, both of Edinburgh, all of Scotland, assignors to Ferranti plc, Cheadle, England

Continuation of Ser. No. 31,670, Apr. 19, 1979, abandoned, which is a continuation of Ser. No. 878,796, Feb. 17, 1978, abandoned. This application Aug. 20, 1980, Ser. No. 179,809

Claims priority, application United Kingdom, Feb. 21, 1977, 7279/77

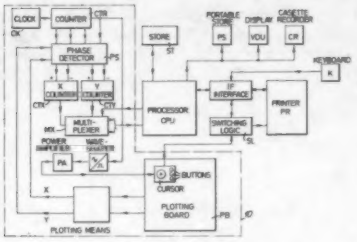
Int. Cl.³ G06F *3/00, 3/12*

U.S. Cl. 364—200 **7 Claims**

1. A data processing system for pre-planning the flight of an aircraft travelling along straight tracks between successive ones of a number of known selected turning points represented on a chart, which system includes

a plotting board having a surface for receiving the chart, said plotting board including means for determining relative digital position coordinates of each selected turning point on said surface with respect to one another and to output signals indicating the relative digital position coordinates of each of the selected turning points,

input means for deriving further signals defining at least one known parameter from the group comprising ground speed, bank angle, initial fuel load, and fuel consumption rate,



calculating means responsive to the signals from the plotting means and to the further signals from the input means to calculate for each track between a pair of selected turning points at least one variable factor from the group comprising track heading, fuel remaining, expected time for the track between the pair of selected turning points and including means for calculating the expected total flight time using the individual expected time calculations arrived at for the plurality of tracks, and

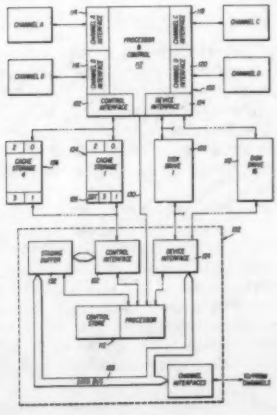
record means for providing a record of the parameters and the variable factors necessary to enable the aircraft to cover the planned route.

4,413,317

MULTIPROCESSOR SYSTEM WITH CACHE/DISK SUBSYSTEM WITH STATUS ROUTING FOR PLURAL DISK DRIVES

Robert E. Swenson, Mendota Heights, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 207,092
Int. Cl.³ G06F *13/00, 13/04, 15/16*
U.S. Cl. 364—200 **11 Claims**



1. A data processing system comprising:

a plurality of host processors for issuing host processor commands;

a plurality of disk drive devices for driving data storage disks, each of said disk drive devices including means responsive to a seek signal for locating data on a disk and producing an interrupt signal;

first and second storage control units connected to said disk drive devices;

connecting paths extending between said storage control units and said host processors;

means for storing a host processor identification table, said table containing values indicating the connection paths between said storage control units and said host processors;

each of said storage control units including,

first means responsive to each host processor command for generating a host identification value specifying the host processor which issued the command, and storing said host identification value with said host processor command;

second means for accessing a stored host processor command and issuing a seek signal to a given one of said disk drive devices;

third means responsive to said first means and an interrupt signal from said given one of said disk drive devices for accessing said host processor identification table to read therefrom a value which defines a connection path between the storage control unit which responds to said interrupt signal and the host processor which issued said given host processor command;

fourth means for generating a status indication; and,

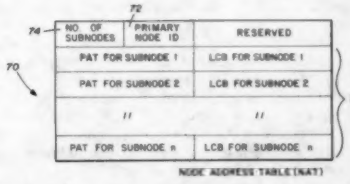
fifth means responsive to said third means and said fourth means for applying said status indication over said defined connection path to the host processor which issued said given command.

4,413,318

USE OF NODES TO UNIQUELY IDENTIFY PROCESSES

Kenneth M. Herrington, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,622
Int. Cl.³ G06F *9/06*
U.S. Cl. 364—200 **6 Claims**



1. A method for uniquely identifying processes in an electronic digital signal processing system used to accomplish tasks in response to work requests, wherein a process comprises a predefined stack, a process control block and a predefined sequence of instructions, comprising the steps of:

storing a process identification code for each of said processes in a memory means associated with said system;

storing one or more subnode addresses in said memory means, each subnode address corresponding to a predetermined grouping of one or more of said processes, wherein at least one of said grouping includes a plurality of processes;

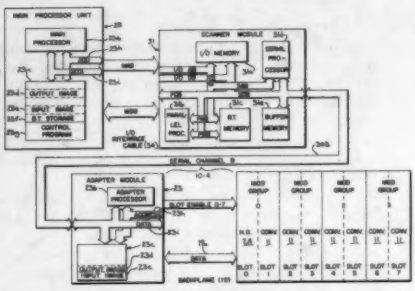
storing a primary node address in said memory means for a processor for identifying that processor, and

providing a work request to select a subnode address and a process identification code to identify a process to be used by said processor to accomplish a task.

4,413,319
PROGRAMMABLE CONTROLLER FOR EXECUTING BLOCK TRANSFER WITH REMOTE I/O INTERFACE RACKS

Ronald E. Schultz, Willoughby; Jonathan S. Veres, Garfield Heights, and Mark J. German, Cleveland Heights, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Mar. 9, 1981, Ser. No. 242,132
Int. Cl.³ G06F 9/06
U.S. Cl. 364—200 **19 Claims**
MICROFICHE APPENDIX INCLUDED
(3 Microfiche, 85 Pages)



1. A remote I/O interface for a digital controller of the type having a main processor for executing a control program to examine and determine I/O status data, memory means associated with the main processor for storing a multiword block of I/O status data, and a plurality of I/O interface racks each adapted to hold a plurality of I/O modules that are responsive to I/O status data to sense and control the status of I/O devices connected to a controlled system, at least one of the I/O interface racks holding a high density I/O module operable to couple a multiword block of I/O status data to or from a group of I/O devices, wherein the remote I/O interface comprises:

a serial data link extending from a proximate end near the main processor to a plurality of remote ends at respective I/O interface racks;

an adapter circuit disposed in the I/O interface rack with the high density I/O module, the adapter circuit including

first adapter means, electrically connected to the I/O modules, for detecting a block transfer request signal from the high density I/O module in response to coupling I/O module address signals and control signals to the I/O modules in a scanning sequence,

second adapter means, electrically coupled to the first means and to one of the distal ends of the serial data link, for coupling the block transfer request signal to the serial data link together with adapter address signals identifying the adapter circuit, and

third adapter means, coupled to the serial data link through the second adapter means, for receiving a block transfer command message and responsive thereto for transmitting a block transfer reply message, the third adapter means also being coupled to the high density I/O module for coupling the multiword block of I/O status data, which is included in one of the messages, between the high density I/O module and the serial data link; and

a scanner circuit coupled between the main processor and the proximate end of the serial data link, the scanner circuit including

first scanner means, electrically connected to the proximate end of the serial data link, for detecting the block transfer request signal and the address signals identifying the adapter circuit from which the block transfer request signal is coupled, the first scanner means being responsive to the block transfer request signal to transmit the block transfer command message through the serial data link to the third adapter means and to receive the block transfer reply message from the third adapter means to couple the multiword block of I/O status data through the serial data link, and

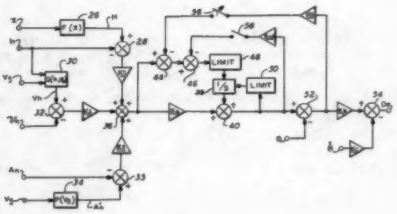
second scanner means, coupled to the memory means that is associated with the main processor and coupled through the first scanner means to the proximate end of the serial data link, for cooperating in the transfer of the multiword block of I/O status data between the first scanner means and the memory means associated with the main processor,

thereby providing the digital controller with the capability of executing block transfers to and from the high density I/O module in whichever one of the I/O interface racks it is disposed.

4,413,320
CONTROL SYSTEM

William E. Brandau, Westwood; Frederic L. Swern, Succasunna, and Kurt Moses, Dumont, all of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Aug. 22, 1980, Ser. No. 180,244
Int. Cl.³ B64C 13/18
U.S. Cl. 364—428 **33 Claims**



1. A control system for controlling an aircraft along a predetermined curvilinear descent path, said aircraft carrying a first and second sensor means for providing signals corresponding to sensed conditions, said system comprising:

longitudinal means connected to said first sensor means and responsive to the signal therefrom for providing a longitudinal signal related to the longitudinal displacement of said aircraft;

height means connected to said longitudinal means and responsive to the longitudinal signal therefrom for providing a height signal functionally related to an altitude of the aircraft required to follow said path;

command means connected to said height means and responsive to said height signal and a signal from said second sensor means for providing an error signal bearing a predetermined relation to the extent of deviation of said aircraft from said predetermined curvilinear descent path; and

means connected to said command means and responsive to said error signal for controlling said aircraft along said predetermined curvilinear descent path.

4,413,321

RAPID DETECTOR OF A WIND GRADIENT

Jean L. Lebrun, Antony, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne S.F.E.N.A., France

PCT No. PCT/FR79/00040, § 371 Date Jan. 7, 1980, § 102(e) Date Jan. 7, 1980, PCT Pub. No. WO79/01039, PCT Pub. Date Nov. 29, 1979

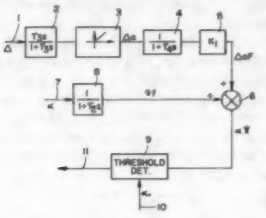
Continuation-in-part of Ser. No. 79,517, Sep. 27, 1979, Pat. No. 4,281,383, which is a continuation of Ser. No. 750,245, Dec. 13, 1976, abandoned. This PCT application May 7, 1979, Ser. No. 185,915

Claims priority, application France, May 8, 1978, 78 13515

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ G06G *7/70*

U.S. Cl. 364—428 4 Claims



1. An arrangement for the rapid detection of a wind gradient, in which a signal representative of a magnitude A, is furnished by a circuit means for solving the equation:

$$(\gamma_T - \gamma_a)\, g - s\left(\frac{V - V_{sol}}{1 + 0{,}2s}\right) = A.$$

A is coupled to a first filter coupled to a retifier circuit, coupled to a second filter, then to an amplifier coupled to a summator which receives a signal α_f representative of the incidence α of the aircraft, derived from a detector of incidence α associated with a third filter, the signal $\alpha\dot{X}$ furnished by the said summator being transmitted to a detector means for comparing the signal $\alpha\dot{X}$ to a reference α_0 and which generates an alarm signal when $\alpha\dot{X}$ exceeds α_0.

4,413,322

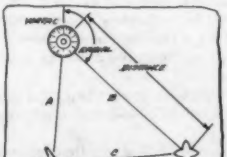
AUTOMATIC WAYPOINT AREA NAVIGATION SYSTEM

George B. Foster, Worthington; Paul D. Gibbs, Blacklick, and Michael A. Smyser, Galena, all of Ohio, assignors to Foster Airdata Systems Inc., Columbus, Ohio

Filed Dec. 17, 1980, Ser. No. 217,417

Int. Cl.³ G06F *15/50*

U.S. Cl. 364—448 42 Claims



1. A navigation device for use with a conventional aircraft navigation system and conventional HSI/CDI having OBS in providing navigational information to waypoint locations defined with respect to a given VORTAC station, said device comprising:

memory means for storing digital data representing waypoints;

means for reading data from the navigation system and for determining the present position of the aircraft with respect to a VORTAC station;

means for reading from the OBS, the intended course of the aircraft;

automatic radial means for automatically determining whether a predetermined radial of the VORTAC station intersects the aircraft's intended course and, if so, for determining the location of such intersection which defines a waypoint; and

means for automatically entering, into said memory means data representing said waypoint.

4,413,323

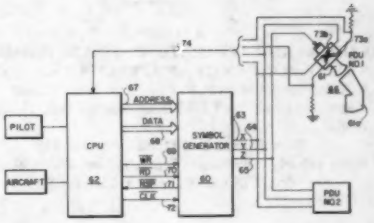
DIGITAL SYMBOL GENERATOR WITH SYMBOL ERROR CHECKING

Hans R. Muller, Kirkland, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Aug. 5, 1980, Ser. No. 175,399

Int. Cl.³ G06F *3/153*

U.S. Cl. 364—521 6 Claims



2. In a digital symbol generator for developing analog deflection signals to drive a cathode ray tube display forming a plurality of symbols by tracing successive vectors, the starting point of a vector being equal to the end point of the previous vector traced, a symbol error checking device comprising:

means for measuring the symbology end point of the last vector generated from the analog deflection signal;

means for converting the symbology end point to a digital value;

processing means for calculating a true end point by digital vector addition of each successive vector generated;

means for comparing the digital value of the symbology end point with the digital sum representing the true end point; and

means for displaying an indication of error on said cathode ray tube display if the symbology end point is not equal to the true end point.

4,413,324

TEMPERATURE PATTERN MEASURING METHOD AND A DEVICE THEREFOR

Masao Tatsuwaki; Shin Nemoto, both of Osaka, and Seiichi Okuhara, Tokyo, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

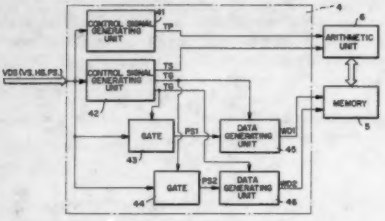
Filed Feb. 25, 1981, Ser. No. 238,360

Int. Cl.³ G01J *5/18*

U.S. Cl. 364—557 13 Claims

1. A temperature pattern measuring method comprising: passing portions of light from parts of an area of an object whose temperature distribution pattern is to be measured, which parts are in a predetermined pattern, through first and

second optical filters which respectively pass different first and second wavelengths of light, determining the level of energy for the respective portions of light passed by the respective filters; and, using the thus determined energy levels, carrying out a two-color temperature determining operation for the respective parts of the area for determining the temperature on



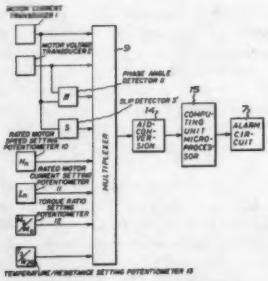
each part of the area of said object by solving the equation $T=\alpha(E_1/E_2)+\beta$, wherein T is the temperature to be determined and E_1 and E_2 are respectively determined energy levels for the first and second wavelengths and α and β are constants, whereby the temperature pattern of the area of the object can be determined from the temperatures of the parts of the area.

4,413,325

METHODS AND APPARATUSES FOR DETERMINING THE TEMPERATURE OF AN ASYNCHRONOUS MOTOR

Bo A. Elfner, and Anders P. P. Comstedt, both of Löddeköpinge, Sweden, assignors to EL-FI Innovationer AB, Helsingborg, Sweden

Filed Mar. 24, 1981, Ser. No. 246,949
Claims priority, application Sweden, Mar. 26, 1980, 8002309
Int. Cl.[3] G06F *15/20*; H02H *7/08*
U.S. Cl. 364—557 6 Claims



1. Apparatus for protecting an asynchronous motor from thermal overload, comprising:

(a) means for applying electric power to said motor;

(b) motor current transducer means, coupled to said power applying means, for detecting a current drawn by said motor and providing a current signal indicative thereof;

(c) motor voltage transducer meas, coupled to said power applying means, for detecting a voltage drop across said motor and providing a voltage signal indicative thereof;

(d) phase angle detector meas, coupled to said current and voltage transducer means, for measuring a phase agle difference between said current and voltage signals and providing a phase signal indicative thereof;

(e) slip detector means, coupled to said current transducer means, for determining an amount of slip of said motor and providing a slip signal indicative thereof;

(f) means for setting a value of rated motor speed;

(g) means for setting a value of rated motor current;

(h) means for setting a torque ratio value equal to M_s/M_n where M_s represents a motor starting torque and M_n represents a motor torque at rated load;

(i) means for setting a temperature T_{start} value and a resistance R_x value wherein T_{start} represents a motor starting temperature and R_x represents motor resistance at a predtermined temperature x;

(j) multiplexer means, having respective inputs coupled to said motor current transducer means, motor voltage transducer means, phase angle detector means, rated motor speed value setting means, rated motor current value setting meas, torque ratio setting means and temperature/resistance value setting means, for multiplexing their respective signals onto an output line;

(k) A/D conversion means, coupled to said multiplexer means output line, for generating digital data signals corresponding to values of said signals coupled to said multiplexer inputs;

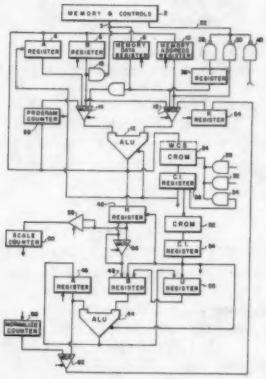
(l) processing means, coupled to an output of said A/D conversion means, for processing said digital data signals to repeatedly determine a winding temperature of said motor and compare the repeatedly determined winding temperature with a previously stored reference value and generating an alarm signal when said winding temperature exceeds said reference value, thereby indicating a thermal overload condition.

4,413,326

FLOATING POINT DIVISION CONTROL

Troy K. Wilson, and Robert J. Handly, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1978, Ser. No. 952,567
Int. Cl.[3] G06F *7/52*
U.S. Cl. 364—748 1 Claim



1. In a computational apparatus having a first and a second microprocessor unit for performing floating point calculations, a method of effecting a floating point division comprising:

manipulating exponent portions of values in said first microprocessor unit;

simultaneously therewith, manipulating normalized mantissa portions of the values in said second microprocessor unit; including

storing the dividend mantissa in a first register;

storing the divisor mantissa in a second register;

performing a step-by-step division of said dividend mantissa by said divisor mantissa;

inserting the quotient bit resulting from each step in the least significant bit position of a third register and shifting that bit one position toward the most significant bit position on each successive step; and

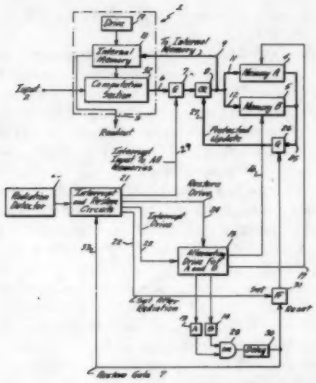
terminating the division operation when a logical "1" appears in the most significant bit position of the third register.

4,413,327

RADIATION CIRCUMVENTION TECHNIQUE

Joseph D. Sabo, Belmont, Mass., and Joel A. Karp, Cupertino, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1970, Ser. No. 59,794
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 5 Claims



1. Apparatus for circumventing the effects of ionizing radiation on a computer having a radiation-resistant internal memory into which information can be written which will be unaffected by ionizing radiation levels below the level at which electrical components of the memory are physically damaged, comprising:

a pair of radiation-resistant memory units into which can be written information which will be unaffected by ionizing radiation below the level at which said physical damage occurs;

means for transferring information simultaneously to the inputs of said memory units and the input of said internal memory so that said pair of units are fed in parallel with said internal memory;

means for alternately driving said memory units so as to have the information available at their inputs recorded in first one and then the other of said memory units such that only one of said units is recording the transferred information during any one recording cycle, each of said units being in a dormant state during the recording cycle of the other of said memory units;

means at said computer responsive to the presence of ionizing radiation above a predetermined background level for isolating said memory units from any further input;

means for determining which of said memory units was dormant at the onset of radiation above said predetermined background level and which therefore contains information unaffected by said radiation; and

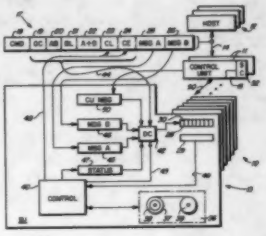
means coacting with said driving means for transferring the information in that unit which was dormant to the internal memory of said computer after said radiation falls below said predetermined background level so that the internal memory of said computer is updated with information unaffected by said ionizing radiation.

4,413,328

STORAGE SUBSYSTEMS EMPLOYING REMOVABLE MEDIA AND HAVING A DIGITAL DISPLAY ON EACH RECORDER

Edwin R. Videki, II, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,168
Int. Cl.³ G06F *13/04, 15/16*
U.S. Cl. 364—900 9 Claims



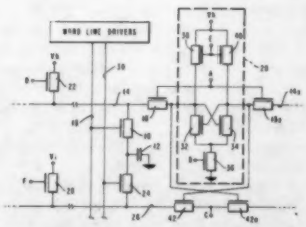
6. A data storage subsystem (10) adapted to be attached to at least one host computer (12) and having a plurality of addressable record storage units (13), each storage unit having a receiver (29) for an exchangeable record member (39), and being capable of receiving instructions from a host computer through a channel (14) and at least one control unit (11), characterized in that each storage unit has a display (28) adjacent to and aligned with the receiver, whereby identification indicia on a record member in the receiver can be readily compared with symbols of the display, sensing means to supply a signal (49) to indicate the presence in or absence from the receiver of a record member, each storage unit (13) and control unit (11) including computer means (61, 110), the control unit computer means being responsive to a display command having an address for an addressed one of the record storage units and received from a host computer requiring operator intervention to exchange record members or to insert a record member, to control the addressed record storage unit computer means, to remove any display of symbols representing a record member then present in the receiver, to indicate the need for removal of such record member from the receiver, and then to display symbols representing a record member to be inserted in the receiver upon sensing of such removal.

4,413,329

DYNAMIC MEMORY CELL

Endre P. Thoma, Colchester, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 219,697, Dec. 24, 1980, abandoned.
This application Sep. 16, 1982, Ser. No. 419,095
Int. Cl.³ G11C *11/24, 11/40, 7/00*
U.S. Cl. 365—189 9 Claims



1. In a memory system comprising a plurality of dynamic

memory cells, and wherein each cell comprises a switchable cell device and a capacitive node, and wherein said switchable cell device is connected to a bit line to read the charge stored at said node and to a first word line to selectively switch said cell device responsive to a first signal in said word line, and

wherein the system includes a sense amplifier to sense the read charge on said bit line, the improvement which comprises,

a cell write device, said cell write device being connected to a write line and to said storage node and also connected to a second word line to selectively switch said cell write device responsive to a second signal in said second word line,

and means to selectively connect said write line to a low voltage value responsive to a sensed low charge at said capacitive node,

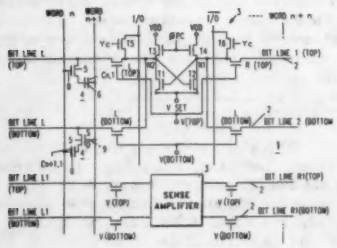
whereby a sensed low charge in said cell is rewritten independently of said bit line and a high charge in said cell is rewritten by said bit line upon reading.

4,413,330

APPARATUS FOR THE REDUCTION OF THE SHORT-CHANNEL EFFECT IN A SINGLE-POLYSILICON, ONE-DEVICE FET DYNAMIC RAM ARRAY

Hu H. Chao, Yorktown Heights, and Robert H. Dennard, Cortlandt, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 280,143
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—205 **15 Claims**



1. A memory array comprising

at least a pair of storage capacitors, a pair of bit lines and a pair of word lines, one and the other said pair of storage capacitors being connected at one electrode thereof by an actuable device to one and the other of said pair of bit lines and at the other electrode thereof to one and the other of said pair of word lines said other electrodes being integral with one and the other of said word lines,

a sense amplifier responsive to the state of said pair of storage capacitors, and,

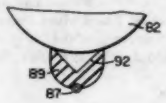
switchable means interconnecting said sense amplifier and one and the other of said pair of bit lines for decoupling an unselected one of said pair of bit lines from said sense amplifier when one or the other of said pair of word lines is selected.

4,413,331

BROAD BEAM TRANSDUCER

Linwood M. Rowe, Jr., Glen Burnie; Dale D. Skinner, and John H. Thompson, both of Severna Park, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1976, Ser. No. 680,254
Int. Cl.³ H04B *13/00*
U.S. Cl. 367—151 **2 Claims**



1. Electroacoustic transducer apparatus comprising:

(A) a carrier vehicle;

(B) a plurality of tubular electrostrictive transducer elements carried by said vehicle and being axially arranged along, and all symmetrically disposed about, a common axis and all operable at the same radial resonant frequency;

(C) isolation means separating adjacent ones of said elements for axially decoupling said elements from one another;

(D) each said element including electrode means on the end surfaces thereof and being poled in said axial direction;

(E) backing means positioned between said carrier vehicle and said plurality of elements to prevent unwanted reflections of acoustic energy and distortion of the beam pattern of said apparatus;

(F) said backing means being an acoustic absorbing material; and

(G) said backing means including an acoustic reflecting layer disposed over said acoustic absorbing material.

2. Electroacoustic transducer apparatus comprising:

(A) a carrier vehicle;

(B) a plurality of tubular electrostrictive transducer elements carried by said vehicle and being axially arranged along, and all symmetrically disposed about, a common axis and all operable at the same radial resonant frequency;

(C) isolation means separating adjacent ones of said elements for axially decoupling said elements from one another;

(D) each said element including electrode means on the end surfaces thereof and being poled in said axial direction;

(E) backing means positioned between said carrier vehicle and said plurality of elements to prevent unwanted reflections of acoustic energy and distortion of the beam pattern of said apparatus;

(F) said backing means being an acoustic directional reflector; and

(G) said reflector including an acoustic absorbing material covering the outside surface of said reflector.

4,413,332

SCANNING BEAMFORMER FOR A VERY HIGH RESOLUTION CIRCULAR ARC SONAR

George A. Gilmour, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 24, 1981, Ser. No. 277,357
Int. Cl.³ G01S *3/82*
U.S. Cl. 367—123 **22 Claims**

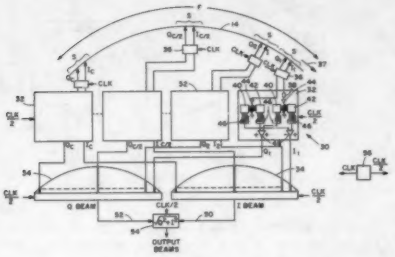
1. In a sonar of the type comprising a soundhead having an arcuate array of hydrophone elements and wherein a plurality of azimuthally ordered beam patterns are sequentially formed from F adjacent hydrophone elements, and wherein due to the geometry of the soundhead, it takes an impinging spherical longitudinally propagating compressional wave a non-zero time to fill the F elements used to form said beam pattern in a particular azimuthal direction, which time limits the resolution of the sonar, a method for sequentially forming said beam

pattern that accounts for the fill time and focuses at all near-field ranges of interest, comprising the steps of:

sampling in quadrature pairs the F elements used to form said beam pattern concurrently in adjacent C groups of S elements each, where C multiplied by S equals F;

processing said C groups of S elements of said F quadrature sampled pairs concurrently to provide C Inphase and Quadrature phase beam component signals;

applying predetermined delays to preselected ones of said C Inphase and Quadrature phase beam component signals in



a manner that depends upon the differential time it takes for said spherical longitudinally propagating compressional wave to fill adjacent groups of said S elements;

combining said selectively delayed Inphase and Quadrature phase beam component signals to provide an Inphase and a Quadrature phase beam; and

computing the square root of the sum of the squares of the magnitude of said Inphase and Quadrature phase beams sequentially to scan said beam pattern through a preselected azimuth.

4,413,333

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

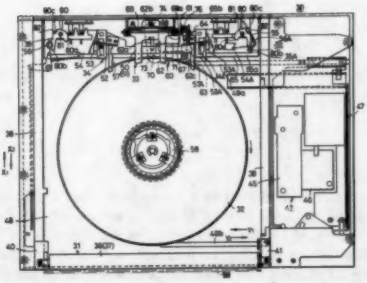
Takashi Saito, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 11, 1982, Ser. No. 357,207

Claims priority, application Japan, Mar. 12, 1981, 56-35574

Int. Cl.³ G11B *17/04, 23/04*

U.S. Cl. 369—77.2 **6 Claims**



1. A rotary recording medium reproducing apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket provided with a space for accommodating said rotary recording medium and an opening for allowing said rotary recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said rotary recording medium reproducing apparatus comprising:

an inserting opening through which said case is inserted;

lid member locking and holding means provided at an innermost part of said reproducing apparatus, for locking and leaving said lid member inside said reproducing apparatus when said case is inserted into said reproducing apparatus, and for releasing the locking with respect to said lid member when an empty jacket is inserted into said reproducing apparatus;

lid member connection releasing means for releasing connection of said lid member with respect to said jacket when said case is inserted into and then pulled out from said reproducing apparatus, and for connecting said lid member to said empty jacket when said jacket is inserted into and then pulled out from said reproducing apparatus;

lid member push-back means for pushing back said lid member released from locking in a direction approaching said empty jacket which is inserted, interrelatedly with the locking releasing operation of said lid member locking and holding means; and

means maintained inoperative upon insertion of said case, and rendered operative upon insertion of said empty jacket, for limiting a final insertion position of said empty jacket inside said reproducing apparatus to a halfway position, the halfway position being a position where said lid member locking and holding means operates to release the locking of said lid member and said lid member push-back means operates but where said lid member connection releasing means remains inoperative.

4,413,334

PICKUP ARM WITH SERVO-CONTROLLED STYLUS

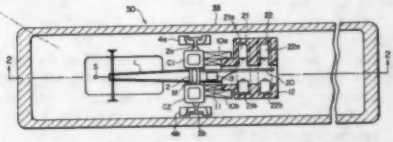
Kunio Goto, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed May 1, 1981, Ser. No. 259,486

Claims priority, application Japan, May 4, 1980, 55-58829

Int. Cl.³ G11B *21/10, 9/06*

U.S. Cl. 369—126 **6 Claims**



1. A system for controlling the orientation of a stylus with respect to the surface of a recording medium having radially spaced apart tracks, said stylus being provided at one end of a pickup arm linearly driven across said tracks, comprising:

pivotal support means mounted at said one end of the pickup arm and pivotable in a direction normal to said recording medium surface;

a cantilever having said stylus at one end thereof and coupled at the other end thereof to said pivotal support means, said cantilever having a substantially smaller mass then said pickup arm;

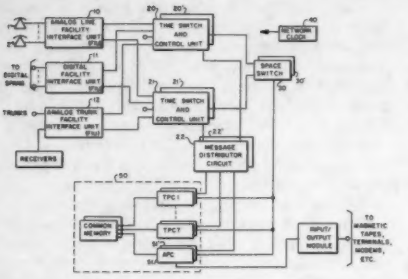
means for detecting the angular displacement of said cantilever from a predetermined orientation caused by displacement of said recording medium from a normal level and in response generating a control signal; and

means for moving said pivotal support means in response to said control signal in the direction of vertical displacement of said recording medium.

4,413,335
FAULT RECOVERY APPARATUS FOR A PCM SWITCHING NETWORK

John L. Clements, and Stig E. Magnusson, both of Phoenix, Ariz., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Nov. 27, 1981, Ser. No. 325,252
Int. Cl.³ H04L *1/22, 1/24;* H04M *3/08*
U.S. Cl. 370—16 **10 Claims**



8. In a digital telephone switching office, network fault recovery apparatus comprising:

telephone subscribers;

a digital switching network for transmitting PCM data samples from specific input time slots to specific output time slots;

means for formulating a test PCM data sampling;

means for switching connected to said digital switching network and operated to interrupt said transmission of said PCM data samples from said digital switching network to said telephone subscribers;

means for transmitting said test PCM data sample connected to said digital switching network via said switching means, said means for transmitting operated in response to said interruption of said transmission of said PCM data samples;

a connection between said means for transmitting and said digital switching network established in response to said transmission of said test PCM data sample to connect said means for transmitting to said digital switching network;

means for trapping said test PCM data sample, said means for trapping connected to said digital switching network; and

means for analyzing said transmitted test PCM data sample with said trapped test PCM data sample whereby, each of said bits of said PCM data sample transmitted to said telephone subscriber are verified for conformity with said transmitted test PCM data sample.

4,413,336
PROCESS FOR TRANSMITTING DATA WITH THE AID OF A START-STOP SIGNAL

Charles Chaillie, Olching, and Konrad Reisinger, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,316
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951914
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—48 **4 Claims**

1. A process for transmitting data from a plurality of groups of data sources as a time-division multiplex signal which is divided into time-division multiplex frame each encompassing a plurality of character frames, comprising the steps of:

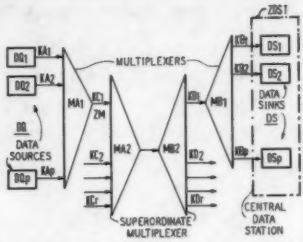
forming a respective character frame for each group of data sources by

transmitting a frame start bit,

transmitting at least one frame stop bit time-spaced from the frame start bit by a plurality of bit positions,

transmitting data bits from respective data sources of a group in some of the bit positions between the frame start bit and the frame stop bit, and

transmitting a code bit in a bit position between the start and stop bits to identify, with a plurality of successive



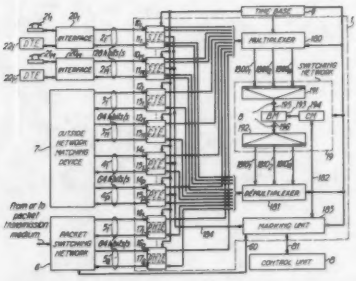
code bits which is smaller in number than the number of character frames of a time-division multiplex frames, the individual character frames and the assignment of the data bits from the data sources to the respective bit locations of the character frame; and

forming the time-division multiplex frame by sequentially transmitting the character frames.

4,413,337
TIME DIVISION SWITCHING SYSTEM FOR CIRCUIT MODE AND PACKET MODE LINES

Jean-Louis Dauphin, 70, Residence Corlay; Olivier F. Louvet, 22, av. de Bormandie Keruhel, and Jean-Marc Pitie, 6, Residence Corlay, all of Lannion, France 22300

Filed Feb. 4, 1981, Ser. No. 231,936
Claims priority, application France, Feb. 13, 1980, 80 03181
Int. Cl.³ H04J *3/04*
U.S. Cl. 370—58 **11 Claims**



1. A time division digital switching system for switching, on the one hand, between first PCM circuit mode digital channels and second PCM bidirectional circuit mode digital lines, each of the first channels being multiplexed with a second packet mode digital channel into a first bidirectional line having a first predetermined rate, as well as fourth bidirectional packet mode digital lines, said first and second channels and said second, third and fourth lines having a second rate half said first rate, each of the first, second, third and fourth channels including incoming and outgoing channels, the first bidirectional line including first incoming digital and first second, third and fourth outgoing digital lines, said system comprising:

first means for demultiplexing the incoming first digital lines into the incoming first and second digital channels;

first means for multiplexing the outgoing first and second channels into the outgoing first digital lines;

second means for multiplexing said incoming first and second channels and the incoming second, third and fourth lines into an incoming digital multiplex having a third predetermined rate;

means receiving said incoming multiplex for bidirectionally switching said first channel of each first line with the first channel of a first line or with a second line and for bidirectionally switching the second channel of each first line with a fourth line to derive an outgoing digital multiplex; and

second means for demultiplexing the outgoing digital multiplex having said third rate which results from the switching operations in said means for switching, into said outgoing first and second channels and the outgoing second, third and fourth lines.

4,413,338

COMMUNICATION SYSTEM FOR INTERCONNECTING A PLURALITY OF ASYNCHRONOUS DATA PROCESSING TERMINALS

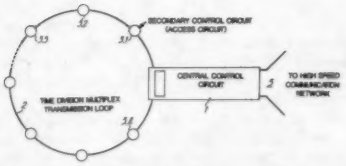
Roger Renoulin, 29, rue Jean Mailleux Thorigne, Vilaine F-35510 Cesson, and Jean-Yves Le Brun, 34, Boulevard Clemenceau, F-35100 Rennes, both of France

Filed Mar. 16, 1981, Ser. No. 244,170

Claims priority, application France, Mar. 20, 1980, 80 06774

Int. Cl.³ H04J *3/16, 6/00*

U.S. Cl. 370—89 **4 Claims**


SECONDARY CONTROL CIRCUIT (ACCESS CIRCUIT)
CENTRAL CONTROL CIRCUIT
TO HIGH SPEED COMMUNICATION NETWORK
TIME DIVISION MULTIPLEX TRANSMISSION LOOP

1. A communication system for connecting to each other a number of asynchronous data processing terminals operating at different speeds, or for connecting the terminals to a high speed switching and communication network, said system comprising a central control circuit means and a plurality of secondary control circuit means, each of said secondary control circuit means being associated with a terminal or a group of terminals, a time division multiplex transmission loop means which transmits a time multiplex of signals in time slots grouped into multiframes of frames of information, a particular time slot of a first frame containing multiframe synchronization information and the corresponding particular time slot in other frames being assigned to provide for an information exchange, counter means in each secondary control circuit means for counting time slots and frame, the outputs of said counter means being coupled to time slot and frame number decoder means, said decoder means having outputs coupled to an AND gate, the output of said AND gate being coupled to the enable input terminals on a first serial-to-parallel converter means, means for applying a time division multiplex of signals to a serial input on said first serial-to-parallel converter means, microprocessor means having an input coupled to parallel outputs of said first serial-to-parallel converter means, an output of said microprocessor means being coupled to the parallel input of a second parallel-to-serial converter means, an enable input of said second parallel-to-serial converter means being coupled to the output of a three input AND gate, the first two inputs of said three input AND gate being respectively coupled to the outputs of the said frame and time slot decoders and the third input of said three input AND gate being coupled to the output of a first flip flop, the output of said three input AND gate being coupled to the multiplex loop means, and the outputs of the time slot and frame number decoders being activated for the duration of said other frames.

4,413,339

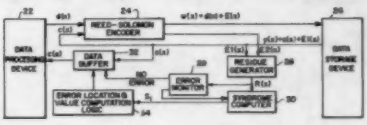
MULTIPLE ERROR DETECTING AND CORRECTING SYSTEM EMPLOYING REED-SOLOMON CODES

Charles M. Riggle, Acton; Lih-Jyh Weng, Lexington, and Norman A. Field, Maynard, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 24, 1981, Ser. No. 277,060

Int. Cl.³ G06F *11/12*

U.S. Cl. 371—38 **19 Claims**



1. A circuit for detecting and correcting errors occurring in a Reed-Solomon code word w(x) constituted by a data word d(x) having k data symbols and a checksum word E(x) having n-k data symbols, the symbols of said checksum word E(x) being elements in the Galois Field GF(2^m), for any integer m greater than 0, said checksum word being derived by encoding said data word d(x) by a predetermined generator polynomial g(x) having roots α^l wherein α is a primitive element in the Galois Field GF(2^m), said circuit comprising:

A. receiving means for receiving a word y(x) that was transmitted as the code word w(x), said word y(x) being comprised of a data word c(x) having k symbols and a checksum word E1(x) having n−k symbols,

B. Reed-Solomon encoding means for encoding said data word c(x) by said generator polynomial g(x) for producing another checksum word E2(x), said encoding means comprising successively connected shift register stages and feedback means that enable encoding of the data word c(x) by said generator polynomial g(x) during shifting of the symbols thereof through said shift register,

C. residue generating means connected to said receiving means and to said encoding means for receiving E1(x) and E2(x) for producing a residue R(x) therefrom by modulo-two summing respective symbols thereof,

D. monitoring means connected to said residue generating means for indicating whether errors have occurred in the received word y(x),

E. logic processing means responsive to said monitoring means for computing error syndromes S_i from said residue R(x) thereby to enable the computation of error location signals and error value signals corresponding to the respective locations and values of errors occurring in data word c(x), and

F. correcting means responsive to said error location and error value signals for correcting errors occurring in data word c(x) located in said receiving means.

4,413,340

ERROR CORRECTABLE DATA TRANSMISSION METHOD

Kentaro Odaka; Yoichiro Sako; Ikuo Iwamoto; Toshitada Doi, all of Kanagawa, Japan, and Lodewijk B. Vries, Eindhoven, Netherlands, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 265,465, May 20, 1981, abandoned. This application Nov. 12, 1981, Ser. No. 320,492

Claims priority, application Japan, May 21, 1980, 55-67608

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—39 **39 Claims**

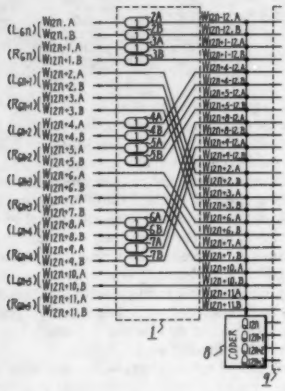
1. A method of transmitting a digital information signal formed of a plurality of sequences of information words, each word being of a predetermined bit length with each such sequence of words occurring in a respective input channel, and

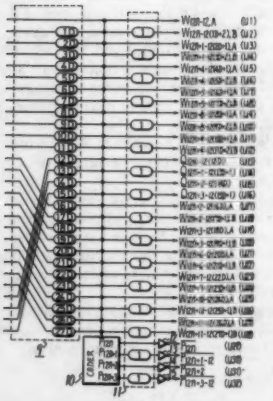
with check words included in the transmitted signal to enable correction of errors occurring in the signal as a result of transmission, comprising the steps of

applying a first block of words, taken one from each such input channel, and having a first arrangement state, to a first error-correcting encoder to generate a series of k first check words;

delaying each of the words in said first block and each of the k first check words by a respective different delay time to provide a resulting second block of words in a second arrangement state;

applying said second block of words to a second error-correcting encoder to generate a series of k second check words; and





transmitting said second block of words together with said second check words; wherein

said first and second check words are generated to satisfy a parity check matrix having n columns and k rows, and in which each element of one predetermined row is selected from digital values from zero to $2^m - 1$, so that the same value does not appear twice in said predetermined row, and wherein the elements in the remaining rows are selected to be a given power, for all the elements in each respective row, of the corresponding elements in said predetermined row, where m is the bit length of said data words and n is the number of words in each block formed of the digital words of the information signal together with the associated check words.

4,413,341

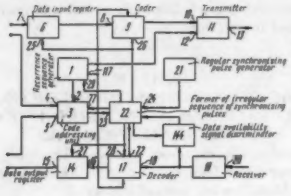
METHOD FOR EXCHANGE OF DATA BETWEEN CENTRAL STATION AND PERIPHERAL STATIONS

Alexandr B. Markhasin, ulitsa Krylova, 41, kv. 22; Gennady V. Belyaev, ulitsa Nikitina, 68, kv. 20; Jury V. Babushkin, ulitsa Turgeneva, 223, kv. 21, and Alexandr K. Petrov, ulitsa Vystavochnaya, 11, kv. 51, all of Novosibirsk, U.S.S.R.

Division of Ser. No. 46,640, Jun. 8, 1979. This application May 26, 1981, Ser. No. 267,338

Int. Cl.[3] **G06F** *11/00;* **H04J** *6/00*

U.S. Cl. 371—72 **9 Claims**



1. A method for an exchange of data through a channel between a central station and peripheral stations, which method comprises the steps of

generating, at said central station, an address signal which is an address sequence including M non-recurrent subsequences designating the addresses of selected peripheral stations, wherein M is an integer, said address sequence having elements meeting a predetermined recurrence relation, and said subsequences which designate the addresses of two successive peripheral stations, being partially overlapping in time;

deriving elementary address signals indicating addresses and elementary data signals indicating data from some of said elements of said address sequence and from other control information elements;

transmitting from said central station to said channel, as each next peripheral station is called on, only those elementary address signals which correspond to the non-overlapping part of said subsequence designating the selected address of the next peripheral station;

providing a series of synchronizing address pulses for generating and transmitting from said central station the steps of said elementary address signals;

discriminating, at each peripheral station, said synchronizing address pulses and elements of the sequence being generated from said address signal;

accumulating the discriminated elements of the sequence being generated and producing a subsequence designating the address of a peripheral station from these elements; and

comparing said subsequence elements with the address of one of said peripheral stations and enabling the exchange of data if said accumulated subsequence elements coincides with the address of a given peripheral station, the improvement consisting of

providing modulation patterns and parameters at said central station to form said elementary signals of addresses of said peripheral stations from the elements of the subsequence;

providing different modulation patterns and parameters at said central station to form said elementary data signals;

successively transmitting from said central station the elementary address signals and elementary data signals of a given peripheral station;

determining at said central station the availability of data for transmission by setting intervals of time between successive elementary address signals depending on the availability of data for transmission from a given peripheral

station to said central station and from said central station to a given peripheral station;

generating, at each peripheral station, an address signal similar to that generated at said central station, said address signal being a sequence having elements having a predetermined recurrence relation;

multiplying, at said peripheral station, said address signal of said peripheral station by the discriminated address signal of said central station and obtaining an error signal indicating an error in one of said address signals;

shifting the phrase of the address signal of said peripheral station with reference to the error signals obtained by the multiplication; and

comparing the accumulated subsequence of elements of the phase-shifted address signal of a given peripheral station with said address of said peripheral station, whereby the accuracy of addressing peripheral stations during successive transmitting of elementary address and data signals is improved.

4,413,342

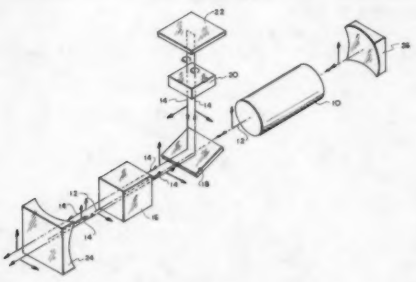
METHOD AND APPARATUS FOR FREQUENCY DOUBLING A LASER BEAM

Martin G. Cohen, Huntington, and Kuo-ching Liu, East Setauket, both of N.Y., assignors to Quantronix Corporation, Smithtown, N.Y.

Filed Nov. 20, 1980, Ser. No. 208,511

Int. Cl.³ H01S *3/10*

U.S. Cl. 372—22 **10 Claims**



1. An apparatus for frequency doubling a laser beam within a laser resonator cavity and providing an output including coincident second harmonic beams of different polarization, comprising:

a laser generating a laser beam of fundamental frequency;

means for doubling the fundamental frequency of said beam from said laser by generating frequency doubled beams which travel in opposite directions along a common axis away from said doubling means;

reflecting means positioned between said laser and said means for doubling the fundamental frequency capable of reflecting one of the frequency doubled beams and transmitting said beam of fundamental frequency;

means for rotating the polarization of the frequency doubled beam reflected by said reflecting means;

means for returning the rotated beam so that it travels along the common axis; and

an output mirror capable of reflecting a beam of the fundamental frequency and transmitting beams of the second harmonic of said fundamental frequency.

4,413,343

LEAD CHALCOGENIDE SEMICONDUCTOR DEVICE

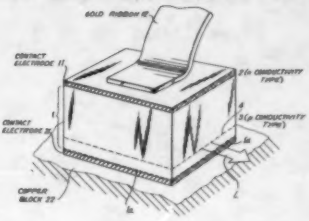
Hirokazu Fukuda, Asahiso, 1-2-7, Matsunouchi Akashi-shi, Hyogo. 673; Koji Shinohara, 4-6-28, Suganodai, Suma-ku Kobe-shi, Hyogo. 654, and Mitiharu Itou, 3-4-34, Seiryodai, Tarumi-ku Kobe-shi, Hyogo. 655, all of Japan

Filed Feb. 20, 1981, Ser. No. 236,611

Claims priority, application Japan, Feb. 22, 1980, 55-21999

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—44 **5 Claims**



1. A lead chalcogenide semiconductor device having a p conductivity type region, an n conductivity type region, a pn junction between said regions and contact electrodes ohmically contacting the p conductivity type region and the n conductivity type region, respectively, said contact electrode contacting said p conductivity type region consisting of gold and an added element of the component elements of said semiconductor device, said contact electrode functioning as the acceptor.

4,413,344

METHOD OF OPERATING A GASDYNAMIC CO_2-LASER

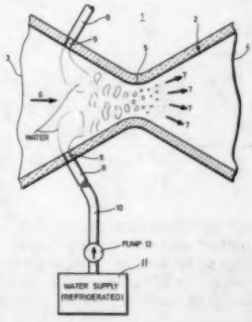
Konrad Altmann, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 268,762

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 3021858

Int. Cl.³ H01S *3/09*

U.S. Cl. 372—90 **7 Claims**



1. A method for operating a gas dynamic CO_2-laser having a Laval nozzle with a nozzle neck, comprising the steps of flowing a lasing medium through said Laval nozzle to produce a lasing medium flow (6), expanding said flowing lasing medium downstream of said nozzle neck for cooling the flowing lasing medium, introducing a cooling liquid into the lasing medium flow (6) near to said nozzle neck for entraining the liquid in the lasing medium flow flowing at high speed, dispersing said liquid by the high speed of the lasing medium flow to thereby form fine liquid droplets, and evaporating the liquid

droplets in the flowing lasing medium for amplifying the cooling of the expanding lasing medium.

4,413,345

GASDYNAMIC LASER

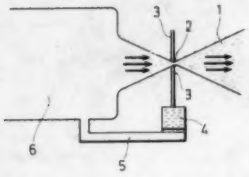
Konrad Altmann, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 268,762, Jun. 1, 1981. This application Jun. 9, 1982, Ser. No. 386,767

Claims priority, application United Kingdom, Jun. 11, 1981, 8117973

Int. Cl.³ H01S *3/09*

U.S. Cl. 372—90 **11 Claims**



1. In a gas dynamic laser having a Laval nozzle with a nozzle neck for expanding and thereby cooling the flowing lasing medium downstream of said nozzle neck, wherein injection means are provided for introducing liquid droplets into the flowing lasing medium for entraining the liquid droplets in the flowing lasing medium, and for evaporating the liquid droplets in the flowing lasing medium for increasing the cooling of the lasing medium.

4,413,346

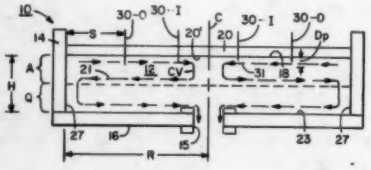
GLASS-MELTING FURNACE WITH BATCH ELECTRODES

Ronald W. Palmquist, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 4, 1981, Ser. No. 317,994

Int. Cl.³ C03B *5/027*

U.S. Cl. 373—41 **16 Claims**



1. A method of operating a glass melting furnace having sidewalls, a bottom wall with a central opening therein forming an open top vessel for containing a bath of molten glass, and at least one group of electrodes for electrically firing the bath from a source of electrical energy, the method comprising the steps of:

selecting individual placement locations for each electrode of each group, said individual placement locations being radially and circumferentially symmetrical relative to a geometric center of the furnace;

limiting the selected placement locations away from the sidewalls of the furnace by a minimum spacing by about 1 to about 2 feet;

placing one each of the electrodes of each group at the individual placement locations selected;

depositing a batch blanket of fusible glass forming batch materials atop the bath of the molten glass;

piercing the batch blanket with said electrodes;

immersing from the top of the furnace a tip portion of said electrodes into the molten glass at each respective location to a selected immersion level immediately below the batch blanket, each tip portion being in relatively close proximity thereto;

electrically firing each group of electrodes in a symmetrical electrical pattern relative to each electrode in the group and each other group of electrodes such that energy dissipation is concentrated immediately below and across the batch blanket and away from the sidewalls of the furnace;

selecting a furnace having respective vertical and lateral dimensions such that melting and refining occurs in relatively narrow active and quiescent zones respectively below each other and an upper surface of the bath; and

selecting an aspect ratio of the vertical dimension of the furnace measured vertically across the active and quiescence zones and a lateral dimension measured across the center from one sidewall to the other of between 1.0 and 0.3.

4,413,347

TERNARY TO BINARY PULSE REGENERATOR FOR A REGENERATIVE REPEATER

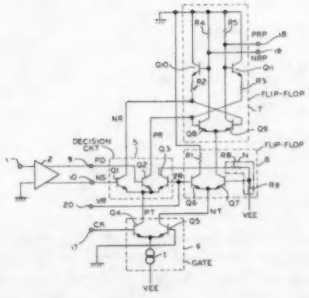
Hirokazu Kobayashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1981, Ser. No. 232,234

Claims priority, application Japan, Feb. 25, 1980, 55-22481; Mar. 6, 1980, 55-28522

Int. Cl.³ H03K *13/24*

U.S. Cl. 375—20 **11 Claims**

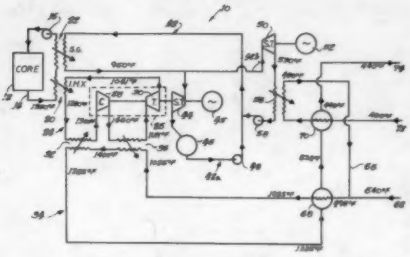


2. A pulse regenerator with low power consumption, said regenerator comprising: means responsive to a receipt of an input ternary pulse sequence for generating first and second ternary pulse sequences having opposite phases, one of said generated ternary pulse sequences having a phase coinciding with the phase of said received sequence, means responsive to a clock pulse sequence received with said input ternary pulse sequence for generating first and second timing signals having opposite phases, one of said timing signals having a phase coinciding with the phase of said received clock pulse sequence, means responsive to one of said generated timing signals for comparing said first and second generated ternary pulse sequences with a reference signal, and means responsive to said comparing means for holding a signal selected from said generated ternary pulse sequence.

4,413,348
SYSTEM FOR PRODUCING PROCESS HEAT

Davorin D. Kapich, Carlsbad, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Jan. 12, 1981, Ser. No. 224,322
Int. Cl.³ G21C *15/00*
U.S. Cl. 376—367 **7 Claims**



1. A system for producing process heat comprising, in combination,

a high temperature gas cooled nuclear reactor having a fuel core and a primary cooling loop through which a coolant is circulated and undergoes an increase in temperature,

a closed secondary loop having a working fluid therein,

said cooling and secondary loops having cooperative association with an intermediate heat exchanger adapted to receive said working fluid therethrough and effect transfer of heat from said coolant to said working fluid as said working fluid passes through said intermediate heat exchanger,

a heat pump connected in said secondary loop and including a turbine and a compressor through which said working fluid passes so that said working fluid undergoes an increase in temperature and pressure as it passes through said compressor,

a process loop including a process heat exchanger adapted to receive a process fluid therethrough, said process heat exchanger being connected in circuit with said secondary loop so as to receive said working fluid from said compressor and transfer heat from said working fluid to said process fluid as it passes through said process heat exchanger,

said secondary loop being operative to pass said working fluid from said process heat exchanger back to said intermediate heat exchanger through said turbine so as to effect driving relation of said turbine,

and a closed steam circuit including a steam generator operatively associated with said cooling loop so as to receive said coolant therethrough and transfer heat from said coolant to condensed steam passing through said steam generator to produce steam, said steam circuit including a steam turbine operatively associated with the turbine of said heat pump so as to assist in driving said compressor,

said process loop including a source of feed gas and a source of process fluid and adapted to mix said feed gas and process fluid and pass the mixture to said process heat exchanger for heating by said working fluid therein.

4,413,349
NON-CONTACT MEASUREMENT SYSTEM AND METHOD FOR DETERMINING THE CONTOUR OF AN ELECTRICALLY CONDUCTIVE SURFACE

Richard E. Bailey, San Diego, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

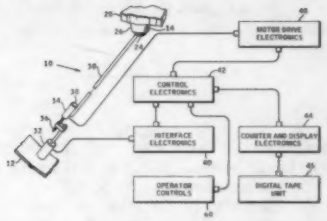
Filed Oct. 31, 1980, Ser. No. 202,796
Int. Cl.³ G01B *7/28*
U.S. Cl. 377—24 **10 Claims**

1. A non-contact measurement system for determining the contour of an electrically conductive surface relative to a fixed reference point comprising:

a support arm journaled at one end to a bearing providing a fixed reference point and adapted to extend toward a first surface having a contour to be determined;

a second separate initial surface is established adjacent to, but separate from the first surface, the contour of which is to be determined whereby a reference length is determined between said fixed reference point and second initial surface without reference to said first surface;

a non-contact probe means coupled to the support arm by an adjustable means adapted to move said probe means either toward or away from said first surface, the contour of which is to be determined or said second surface, and



which generates an electrical indication of its axial distance from said fixed reference point, the axial distance from said second surface providing said reference length;

electrical means coupled to said non-contact means to display the distance symbolized by the electrical signal; and

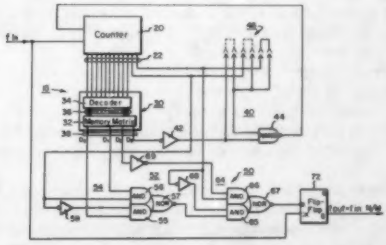
control means coupled to said adjustable means and operable to direct the probe means to extend toward the first surface until it reaches a predetermined distance from the surface;

whereby the length of the axial distance traveled by said probe from the fixed reference point to said predetermined distance from the first surface having the contour to be determined is compared with said reference length to determine said contour.

4,413,350
PROGRAMMABLE CLOCK RATE GENERATOR

William C. Bono, Bethel, and Gary A. Profet, Watertown, both of Conn., assignors to General DataComm Industries, Inc., Danbury, Conn.

Filed Jan. 12, 1981, Ser. No. 224,336
Int. Cl.³ G06M *3/00*; H03K *21/36*
U.S. Cl. 377—47 **15 Claims**



1. A clock rate generator comprising:

a counter to which is applied an input clock signal,

a memory having an input to which is applied a portion of the output of said counter and an output on at least three output lines,

counter reset logic connected to one output line from said memory for resetting the counter,

means that are controlled by said counter and are connected to at least two other remaining output lines from said memory, for selecting for an output signal the signal on only one of said remaining output lines from said memory, and

means that are connected to said selecting means so as to receive the output signal therefrom for combining successive output signals from said selecting means which have the same binary state, whereby the output signal from said combining means has a clocking rate which is an integral fraction of that of the input clock signal, the denominator of said fraction being determined by the number of counts between successive resets of said counter and the numerator being determined by the number of cycles in said output signal between successive resets of said counter.

4,413,351
COMPUTER TOMOGRAPHY APPARATUS

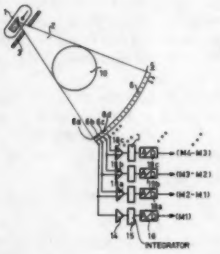
Günter Kowalski, Rellingen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,631

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 3012648

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—19 **8 Claims**



1. In a device for determining the absorption distribution of radiation in a flat examination zone in a body, comprising:

a radiation source which is rotatable about the body and which emits a fan-shaped radiation beam which extends in the plane and which completely irradiates the examination zone from different directions;

a detector array which comprises individual detectors for generating detector output signals which are a measure of the absorption of radiation;

means for amplifying the detector output signals;

analog-to-digital converters for converting the amplified signals to digital form; and

means for generating and displaying the absorption distribution from the detector output signals; the improvement comprising:

means connected to at least a part of the detector array which, for each pair of adjacent detectors therein, form a difference measurement value which is proportional to the difference between the corresponding, non-amplified detector output signals;

further means, connected to at least one detector of said part, which form an absolute measurement value which is proportional to its signal; and

adding means which add the difference measurement value to the absolute measurement value.

4,413,352
X-RAY STEREOSCOPIC CINEMATOGRAPHY APPARATUS

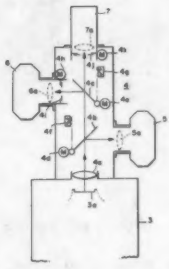
Kohsaku Nishio, Ootahara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 30, 1981, Ser. No. 316,674

Claims priority, application Japan, Oct. 30, 1980, 55-152668

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—42 **7 Claims**



1. An X-ray stereoscopic cinematography apparatus for selectively producing images of an object in a stereoscopic cinematography mode, a single cinematography mode, and a fluoroscopy mode by means of first and second cinecameras, each of the cinecameras including a rotatable shutter and an associated shutter position detector generating shutter position signals, the shutter of the first cinecamera being out of phase with the shutter of the second cinecameras, the apparatus comprising:

an X-ray tube having at least a pair of focal spots from which X-rays are independently irradiated through the object to create an X-ray image thereof;

means for converting said X-ray image to a corresponding optical image;

an optical system device for selectively distributing said optical image, said optical system device including a first half-mirror having a reflection rate of substantially one-half and being positionable in a first position to reflect said optical image to said first cinecamera and in a second position removed from the light path of said optical image and a second half-mirror having a comparatively low transmission rate and being positionable into a first position to reflect said optical image to said second cinecamera and a second position removed from the light path of the optical image;

a television camera for receiving the light intensity of said optical image not reflected by said first and second half-mirrors and for converting said received optical image to corresponding electric signals;

a mode setter for selecting one of said stereoscopic cinematography mode, single cinematography mode, and said fluoroscopy mode;

a radiographic control device for controlling the positioning of said first and second half-mirrors into and out of said first and second positions, for controlling photographing of said optical image by said first and second cinecameras, and for issuing X-ray exposure control switching signals synchronized to the positions of said shutters of said first and second cinecameras in accordance with said shutter position signals; and

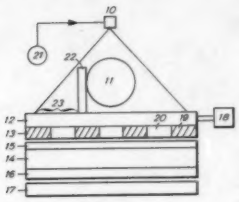
means for selectively performing on-off control of the X-rays irradiated from each of said focal spots of said X-ray tube responsive to said X-ray exposure control switching signals.

4,413,353

X-RAY ENCODING SYSTEM USING AN OPTICAL GRATING

Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025; Bruno Strul, 2633 Waverley St., Palo Alto, Calif. 94306, and Robert E. Alvarez, 2369 Laura La., Mountain View, Calif. 94043

Filed Sep. 3, 1981, Ser. No. 299,208
Int. Cl.³ A61B 6/00; G01N 23/04; G03B 41/16; H04N 5/32
U.S. Cl. 378—062 26 Claims



6. Apparatus for encoding x-ray image onto a photosensitive surface for subsequent decoding with a scanning operation comprising:

a scintillating screen which converts the impinging x-ray image information into a light image; and

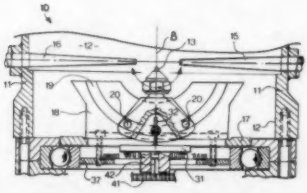
a one-dimensional optical grating having opaque and transparent parallel strips of substantially equal width placed between the scintillating screen and the photosensitive surface whereby the x-ray image is encoded as modulations of the grating pattern.

4,413,354

X-RAY DIFFRACTION CAMERA

Vincent J. Manners, New South Wales, Australia, assignor to Commonwealth of Australia, Canberra, Australia

Filed Feb. 3, 1981, Ser. No. 231,081
Claims priority, application Australia, Feb. 5, 1980, PE2248
Int. Cl.³ G01M 23/20
U.S. Cl. 378—81 4 Claims



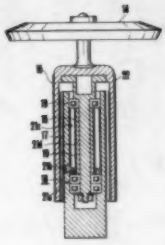
1. An x-ray camera comprising a sample mounting including a sample support to position the sample at a predetermined location, means to receive and support a film, means to direct x-rays at the sample so that scattered rays leaving said sample expose said film, and drive means to rotate said sample about two generally normal axes intersecting at said location, said drive means including a hypocycloidal gear train having a base gear to which said mounting is attached, said base gear being rotatable about one of said axes, and a planetary gear meshingly engaged with said base gear and wherein said sample support is coupled to said planetary gear so as to be rotated about the other axis.

4,413,355

ROTARY ANODE TYPE X-RAY TUBE

Toshio Matsumoto, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1981, Ser. No. 234,010
Claims priority, application Japan, Mar. 26, 1980, 55-37433
Int. Cl.³ H01J 35/04
U.S. Cl. 378—127 8 Claims



1. A rotary anode type X-ray tube having an enclosure, a target rotatably supported within the enclosure and serving as a source of X-ray generation, a cylindrical rotor connected to the target, for rotating the target by the action of rotating magnetic field produced by a winding provided around the enclosure, a rotary shaft on the central axis of the rotor for rotation of the target, and a stationary cylindrical housing concentric with the rotor interposed between the rotor and rotary shaft, for supporting the rotary shaft through rolling bearing means having inner and outer races, said X-ray tube having means interposed between said rotor and said rotary shaft for reducing the difference of temperature between the inner and outer races of said rolling bearing means to 50° C. or less comprising blackening surface treatment films formed on the opposed surfaces of said shaft mounting said inner race and the inner surface of said stationary cylindrical housing supporting said outer race.

4,413,356

FLAT ROTARY-ANODE X-RAY TUBE

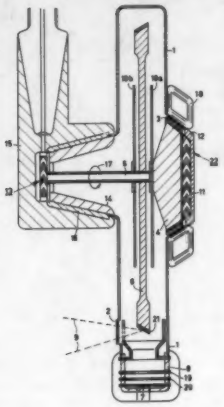
Walter Hartl, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 84,971, Oct. 15, 1979, abandoned. This application Oct. 28, 1981, Ser. No. 315,700
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2845007
Int. Cl.³ H01J 35/04
U.S. Cl. 378—132 5 Claims

1. An X-ray tube comprising a housing containing a rotary-anode attached to a shaft for rotation therewith around a longitudinal axis of the shaft, electromotive means for effecting rotation of the shaft, and a plurality of bearings each including first and second parts which are disposed around the axis and rotatable relative to each other, the first part of each bearing being attached to an inner surface of the housing and the second part being attached to the shaft, thereby effecting rotatable mounting of the anode within the housing,

the improvement comprising providing at least one of said bearings in the form of a sleeve bearing, the second part of the sleeve bearing being attached to the shaft by means of

an intermediate electrical insulator having a tapered end in closer proximity to the anode than the respective bearing,



the diameter of said tapered end decreasing with decreasing axial distance from the anode.

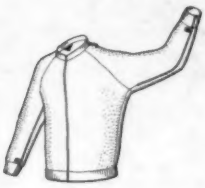
DESIGN PATENTS

GRANTED NOV. 1, 1983

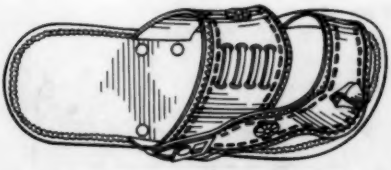
ERRATA

For CLASS	See PATENT NO.
D02–159	271,225
D06–093	271,234

271,154
SWEATSHIRT OR SIMILAR ARTICLE
Matthew M. Dowling, 21 Dalton Ct., Pacheco, Calif. 94553
Filed May 11, 1981, Ser. No. 262,334
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—184



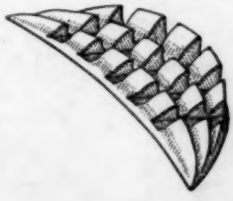
271,155
SANDAL OR SIMILAR ARTICLE
Mansour Mansour, 409 Waldo St., New Castle, Pa. 16101
Filed Jun. 19, 1981, Ser. No. 275,149
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270



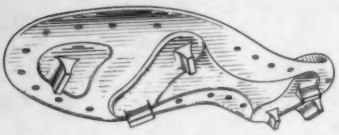
271,156
PEDICURE SANDAL
Margaret Williamson, 27303 Dewdrop Ave., Canyon Country, Calif. 91351
Filed Jul. 20, 1981, Ser. No. 284,934
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270

271,157
ATHLETIC SHOE WITH POCKET
Robert J. Gamm, Olivette, Mo., assignor to Envoys U.S.A., Inc., Maryland Heights, Mo.
Filed Sep. 25, 1980, Ser. No. 190,849
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

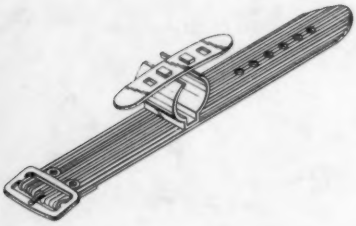
271,158
RUNNING SHOE HEEL
Thomas P. Hopper, R.F.D. #1, Box 689, Durham, Conn. 06422
Filed Sep. 15, 1980, Ser. No. 187,200
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—317



271,159
BASEBALL SHOE SOLE
Roberto Muller-Feigelstock, Scarsdale, N.Y., assignor to Pony International, Inc., New York, N.Y.
Filed Aug. 24, 1981, Ser. No. 295,336
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—317

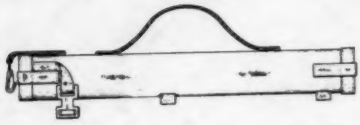


271,160
FLASHLIGHT HOLDER
Gerald A. Sherwin, 34740 Jaclyn Dr., Solon, Ohio 44139
Filed Apr. 12, 1982, Ser. No. 367,743
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—400

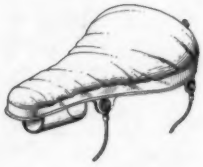


271,161
VIDEO CASSETTE BOOK COVER STORAGE RECEPTACLE PACKAGE
Edward M. Compton, 7116 Three Chopt Rd., Richmond, Va. 23226
Filed Feb. 27, 1981, Ser. No. 238,751
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

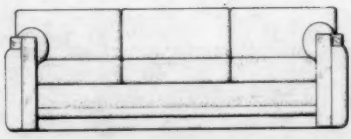
271,162
SPORTS EQUIPMENT CARRIER
Bobby L. Evans, Box 156, McConnell, W. Va. 25633
Filed Mar. 16, 1981, Ser. No. 244,214
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—36



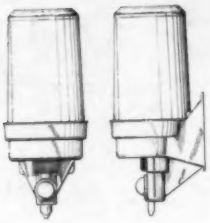
271,163
BICYCLE SADDLE CUSHION
George F. Johnson, High Meadow Rd., Troy, N.Y. 12180
Filed Aug. 6, 1981, Ser. No. 290,710
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—48.1



271,164
SEAT
Morris F. Fisher, North Palm Beach, Fla., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Oct. 16, 1981, Ser. No. 311,854
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



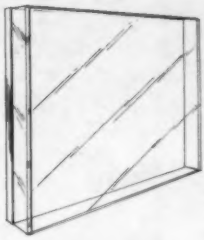
271,165
SOAP DISPENSER
Lars B. Lander, Zug, Switzerland, assignor to Molnlycke AB, Gothenburg, Sweden
Filed Dec. 10, 1979, Ser. No. 102,114
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



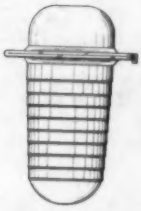
271,166
TABLE
Anthony J. Morabito, 930 E. Middle Ave., San Martin, Calif. 95046
Filed Jun. 4, 1981, Ser. No. 270,595
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—152

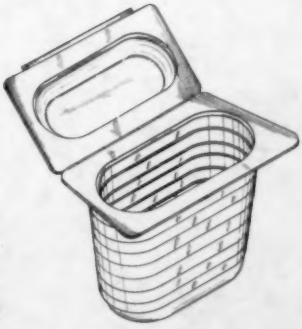
271,167
TABLE BASE
Lawrence F. Caulkett, 2206 Oak St., #E, Santa Monica, Calif. 90405
Filed Dec. 21, 1979, Ser. No. 106,092
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

271,168
DISPLAY FRAME
Andrew R. Antonczyk, 1030 N. State, Chicago, Ill. 60610
Filed Jun. 29, 1981, Ser. No. 278,058
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—242

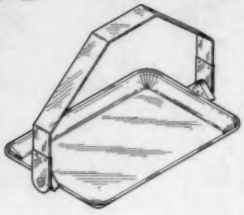


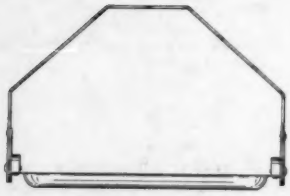
271,169
FOOD CONTAINER/HOLDER
John C. Hollenbeck, c/o Riede, Rosenberg, McCale & Cahill, 1000 Fourth St., San Rafael, Calif. 94901
Filed Apr. 2, 1981, Ser. No. 250,114
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—16



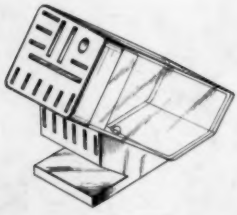


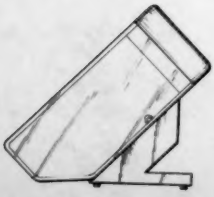
271,170
TRAY
Arthur Goldstein, School La.,, Swavesey, Cambridge, England
Filed May 22, 1981, Ser. No. 266,173
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—19



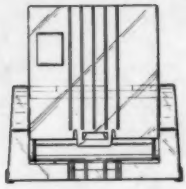


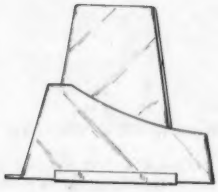
271,171
KNIFE HOLDER
Stuart L. Kinkade, 1390 West Evans, Denver, Colo. 80223
Filed May 26, 1981, Ser. No. 267,088
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—74





271,172
TOOTHPICK DISPENSER
Jack Allen, P.O. Box 3443, Knoxville, Tenn. 37917
Filed Feb. 2, 1982, Ser. No. 345,088
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—75





271,173
ICE BUCKET
Antoine H. Keshishian, 8132 Springfield Village Dr., Springfield, Va. 22152
Filed Apr. 8, 1981, Ser. No. 252,252
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—78

271,174

MICROWAVE CORN POPPER WITH COVER

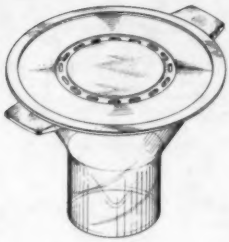
Robert F. Bowen, Burlington, and Thomas J. Martel, North Reading, both of Mass., assignors to Raytheon Company, Lexington, Mass.

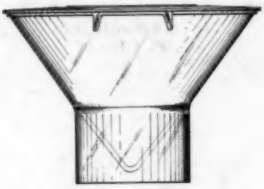
Filed Feb. 18, 1982, Ser. No. 349,746

Term of patent 14 years

Int. Cl. D07—*02*

U.S. Cl. D7—325





271,175

PIZZA OVEN

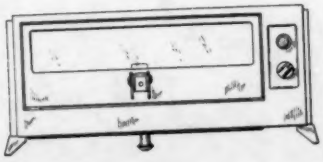
Ferdinand F. Salzmann, Prairie du Sac, and James P. Swinehart, Oregon, both of Wis., assignors to Wisco Industries, Inc., Oregon, Wis.

Filed Jun. 2, 1981, Ser. No. 269,639

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—350



271,176

HAND HELD ELECTRIC MIXER

Jose Z. Zimnowicz, Barcelona, Spain, assignor to Braun Espanola, S.A., Spain

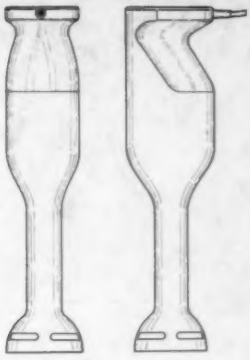
Filed Oct. 22, 1980, Ser. No. 199,621

Claims priority, application Spain, Apr. 23, 1980, 96876

Term of patent 14 years

Int. Cl. D7—*04*

U.S. Cl. D7—379



271,177

PROOFING TRAY

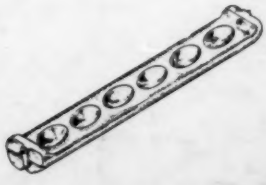
John M. Lucido, Richardson, Tex., assignor to Bettendorf Stanford Inc., Salem, Ill.

Filed Nov. 16, 1981, Ser. No. 321,568

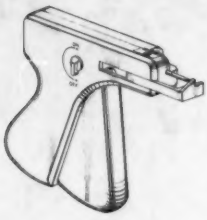
Term of patent 14 years

Int. Cl. D7—*02*

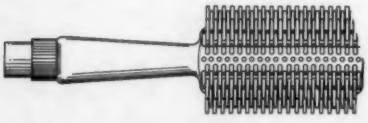
U.S. Cl. D7—387



271,178
LOCKING PIECE FITTER FOR LABELS, PRICE TAGS AND THE LIKE
Tadashi Suzuki, Saitama, Japan, assignor to Satogosei Co., Ltd., Tokyo, Japan
Filed Mar. 18, 1981, Ser. No. 244,862
Claims priority, application Japan, Sep. 19, 1980, 55-38728
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



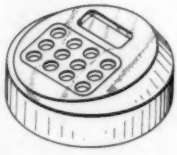
271,179
COMBINED TOUCH UP HAIR BRUSH WITH HAIR SPRAY DISPENSER
Elbert R. Smith, 311 Spenseth Dr., Montgomery, Ala. 36109
Filed Jul. 2, 1981, Ser. No. 279,820
Term of patent 14 years
Int. Cl. D9—*01;* D4—*02*
U.S. Cl. D9—338



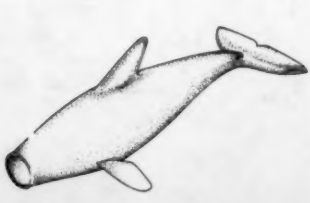
271,180
JAR FOR COSMETICS
Richard Runyon, Los Angeles, Calif., assignor to Celle, Inc., Beverly Hills, Calif.
Filed Jul. 7, 1981, Ser. No. 281,283
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—370

271,181
BOTTLE
Richard Runyon, Los Angeles, Calif., assignor to Celle, Inc., Beverly Hills, Calif.
Filed Jul. 7, 1981, Ser. No. 281,282
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—389

271,182
ELECTRONIC TIMER
Anthony J. Iorio, Providence, R.I., assignor to Avitar, Inc., Rumford, R.I.
Filed Apr. 9, 1981, Ser. No. 252,382
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



271,183
WIND SOCK
Kenneth L. Conrad, and Suzanne G. Sadow, both of 1518 First Ave. South, Seattle, Wash. 98104
Filed Aug. 13, 1981, Ser. No. 292,347
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—59



271,184
CASING GAUGE
Jim A. Gentry, Tulsa, Okla., assignor to E. C. Carman Gauge Co., Inc., Tulsa, Okla.
Filed Dec. 7, 1981, Ser. No. 308,275
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

271,185
MEASURING CALIPER
Andrew J. Dermond, c/o Sherry Personnel Service, Inc., 318 Robinson Building, Philadelphia, Pa. 19102
Filed Nov. 2, 1981, Ser. No. 317,002
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

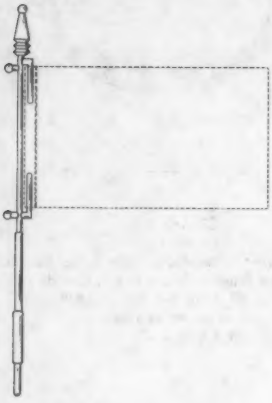
271,186
NECKLACE
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed Feb. 9, 1981, Ser. No. 232,802
Claims priority, application Italy, Aug. 13, 1980, 35957[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

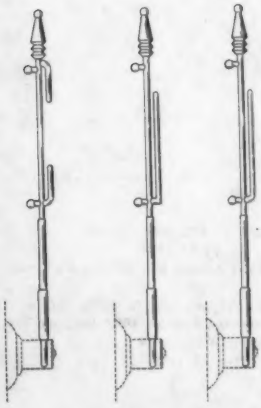
271,187
NECKLACE
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed Feb. 26, 1981, Ser. No. 238,545
Claims priority, application Italy, Sep. 2, 1980, 359788/80[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

271,188
PENDANT
Peter G. Weeks, Toronto, Canada, assignor to Rembrandt Jewelry Manufacturing Limited, Scarborough, Canada
Filed Jul. 27, 1981, Ser. No. 286,829
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

271,189
PLANTER
Paul D. Peterson, 3310 Azahar Pl., Rancho La Costa, Calif. 92008
Division of Ser. No. 74,880, Sep. 12, 1979, Pat. No. Des. 268,256. This application Jun. 24, 1982, Ser. No. 391,547
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—154

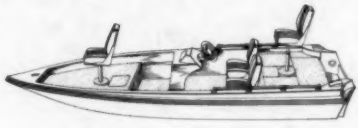
271,190
FLAGSTAFF
Murat Dostourian, Gobernador Vigodet 2837, Montevideo, Uruguay
Filed Feb. 4, 1981, Ser. No. 231,434
Claims priority, application Argentina, Aug. 4, 1980, 39973
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—181



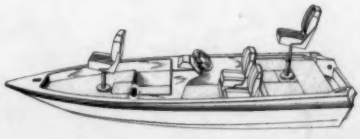


271,191
AIR SPOILER
Ralph J. Amprim, Warren; Leif H. Chapman, Sylvan Lake, and Richard Ruzzin, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 4, 1982, Ser. No. 354,741
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

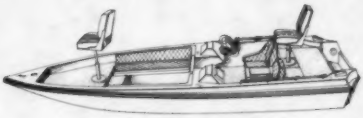
271,192
BOAT
Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.
Filed Jun. 5, 1981, Ser. No. 271,004
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—300



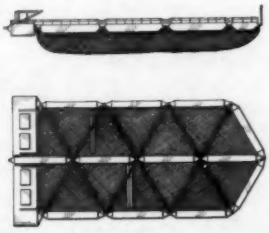
271,193
BOAT
Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.
Filed Jun. 5, 1981, Ser. No. 270,834
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—300



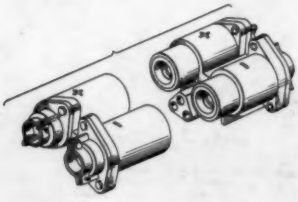
271,194
BOAT
Forrest L. Wood; Mickey C. Wood, both of Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, Bull Shoals, and Gary L. Wilson, Flippin, all of Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.
Filed Jun. 4, 1981, Ser. No. 270,562
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—300



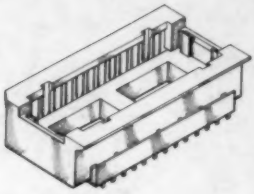
271,195
FISH-BREEDING SEA VESSEL
Aulis U. Nurmi, Sirkkalankatu 27 A 29, SF-20700 Turku 70, Finland
Filed Feb. 17, 1981, Ser. No. 234,493
Claims priority, application Finland, Aug. 19, 1980, 587/80
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—316



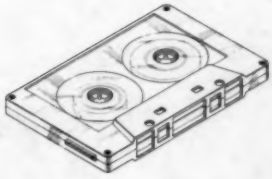
271,196
ELECTRICAL CONNECTOR
Joseph E. Tetreault, Norwell, Mass., assignor to Anderson Power Products, Inc., Boston, Mass.
Filed Sep. 6, 1979, Ser. No. 72,960
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



271,197
COMBINED INTEGRATED CIRCUIT PACKAGE CARRIER AND SOCKET ASSEMBLY
James C. Jones, Floyd County, and James A. Emerson, Washington County, both of Ind., assignors to Robinson-Nugent, Inc., New Albany, Ind.
Filed Feb. 23, 1981, Ser. No. 236,795
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

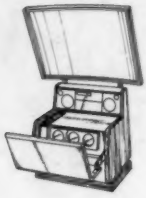


271,198
TAPE CASSETTE
Tokuzo Shimizu, 4-7, Tamagawa-denenchohfu 2-chome, Setagaya-ku, Tokyo, Japan
Filed Oct. 30, 1980, Ser. No. 202,202
Claims priority, application Japan, May 16, 1980, 55-19242
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11

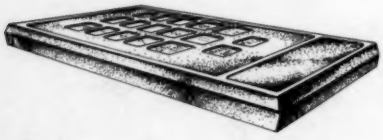


271,199
PICK-UP CARTRIDGE
Josef F. G. Gersets, Bree, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 4, 1981, Ser. No. 231,533
Claims priority, application Benelux, Aug. 6, 1980, 54901-01
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—28

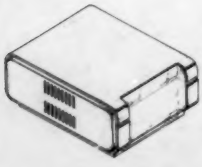
271,200
PROJECTION TELEVISION RECEIVER
Kozo Kawasaki, Ikeda, and Hiroyuki Katada, Osaka, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed May 6, 1981, Ser. No. 261,080
Claims priority, application Japan, Nov. 8, 1980, 55-46791
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—79



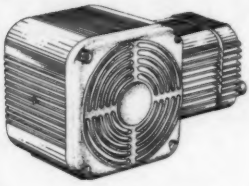
271,201
REMOTE CONTROL UNIT FOR CABLE TELEVISION CONVERTER OR SIMILAR ARTICLE
Svein T. Nordberg, El Paso, Tex., assignor to GTE Products Corporation, Stamford, Conn.
Filed Aug. 24, 1981, Ser. No. 295,206
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—85



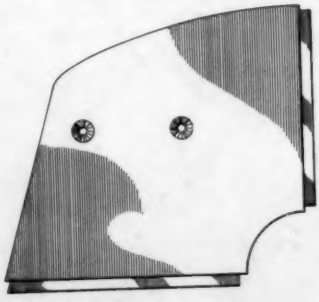
271,202
COMPUTER DISK DRIVE
Evert Endt, Paris, France, assignor to Thomson-CSF, Paris, France
Filed Jan. 21, 1981, Ser. No. 226,662
Claims priority, application Hague, Jul. 21, 1980, DM/000276
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—109



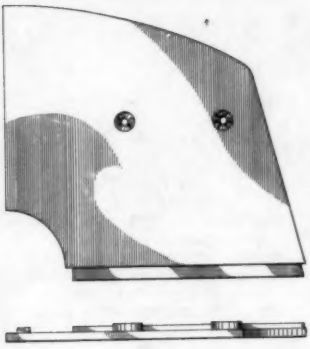
271,203
AIR COMPRESSOR WITH AXIALLY EXTENDING COOLING FINS
Peter Schütt; Klaus Nitsche; Horst Grindler; Hans-Joachim Hofmann, and Hans E. Slany, all of Baden-Württemberg, Fed. Rep. of Germany, assignors to Durr-Dental GmbH & Co., KG, Baden-Württemberg, Fed. Rep. of Germany
Filed Feb. 27, 1981, Ser. No. 239,166
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9



271,204
ABRASIVE BLASTING WHEEL LINER
W. David Watts, P.O. Box 48,166, Atlanta, Ga. 30362
Filed Apr. 22, 1981, Ser. No. 256,608
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

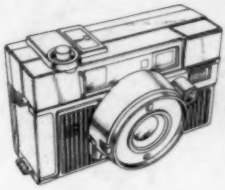


271,205
ABRASIVE BLASTING WHEEL LINER
W. David Watts, P.O. Box 48,166, Atlanta, Ga. 30362
Filed Apr. 22, 1981, Ser. No. 256,498
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

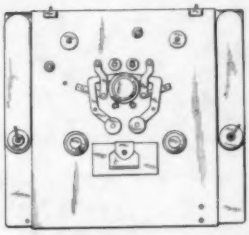


271,206
DETENT COUPLED DRILL BIT ADAPTER
William M. Devey, Elk Grove, Calif., assignor to Melvin C. Bell, Elk Grove, Calif.
Filed Mar. 11, 1981, Ser. No. 242,451
Term of patent 14 years
Int. Cl. D15—*09*; D24—*02*
U.S. Cl. D15—138

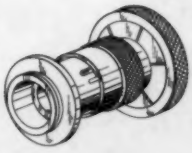
271,207
CAMERA
Koichi Soda, Toyko, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Sep. 4, 1981, Ser. No. 299,611
Claims priority, application Japan, Mar. 4, 1981, 56-8861
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



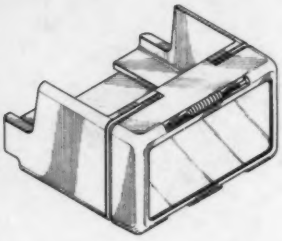
271,208
FILM TRANSPORT UNIT FOR A MOTION PICTURE PROJECTOR
Donald G. Daggett, and Barry C. Brown, both of St. Leonards, Australia, assignors to Syncsound Pty. Limited and Donald Daggett Pty. Limited, both of St. Leonards, Australia
Filed Jan. 30, 1981, Ser. No. 230,183
Claims priority, application Australia, Aug. 15, 1980, 81808
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D16—26



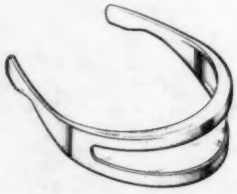
271,209
OPTICAL COUPLER FOR A MICROSCOPE OR SIMILAR ARTICLE
Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.
Filed Sep. 17, 1982, Ser. No. 419,124
Term of patent 14 years
Int. Cl. 16—*05*
U.S. Cl. D16—38



271,210
ELECTRONIC FLASH ADAPTER
Steven W. Shull, Culver City, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.
Filed Apr. 3, 1981, Ser. No. 250,688
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



271,211
SUN GLASSES
Niclas P. Raicevic, 4700 Colfax, North Hollywood, Calif. 91602
Filed Jun. 2, 1981, Ser. No. 269,644
Term of patent 14 years
Int. Cl. D16—*06*; D2—*03*
U.S. Cl. D16—112



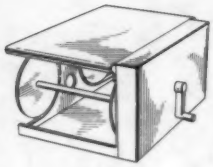
271,212
PEN OR SIMILAR ARTICLE
Kunio Itoh, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha d.b.a. Pentel Co., Ltd., Tokyo, Japan
Filed Mar. 12, 1982, Ser. No. 357,798
Claims priority, application Japan, Oct. 28, 1981, 56-48052
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—48

271,213
GUMMED STACK OF PAPER CLIPS
Hisao Sato, Dai-ni Hikari-so, 10 Toyotama Minami 3-chome, Nerima-ku, Tokyo, Japan
Filed Jun. 29, 1981, Ser. No. 278,347
Claims priority, application Japan, May 28, 1981, 56-022960
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—65

271,214
PAPER CLIP
Hisao Sato, Dai-ni Hikari-so, 10 Toyotama Minami 3-chome, Nerima-ku, Tokyo, Japan
Filed Jun. 29, 1981, Ser. No. 278,348
Claims priority, application Japan, May 28, 1981, 56-22961
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—65

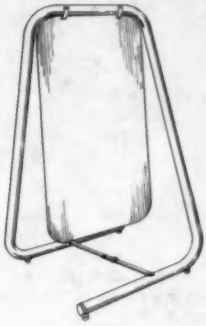
271,215
COMBINED ADHESIVE CONTAINER AND DISPENSER
Philip B. Hinkle, West Hartford, Conn., assignor to Loctite Corporation, Newington, Conn.
Filed Sep. 14, 1981, Ser. No. 301,782
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—66

271,216
AUDIT TAPE SCANNER
Paul E. Becking, P.O. Box 3200, Monterey, Calif. 93940
Filed Aug. 3, 1981, Ser. No. 289,200
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—89



271,217
COMBINED COPY STAND AND ELECTRONIC INTERFACE DEVICE
James W. M. Bee, Palo Alto, and William J. Bauchwitz, Redondo Beach, both of Calif., assignors to Northern Telecom Inc., Nashville, Tenn.
Filed Jun. 15, 1981, Ser. No. 273,405
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

271,218
DISPLAY STAND
Ian W. Farmer, Waltham Cross, England, assignor to Arken, Inc., Bloomfield Hills, Mich.
Filed Jul. 10, 1981, Ser. No. 282,240
Claims priority, application United Kingdom, Feb. 13, 1981, 998893
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10



271,219
DISK FOR MATRIX DISPLAY
Donald Morrison, Spokane, Wash., assignor to American Sign & Indicator Corporation, Spokane, Wash.
Filed Dec. 11, 1980, Ser. No. 215,364
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—42

271,220
VIDEO GAME JOYSTICK APPARATUS
Harry Fox, New York, N.Y., and Peter A. L. Law, Hong Kong, Hong Kong, assignors to Spectravideo International Limited, Hong Kong, Hong Kong
Filed Nov. 9, 1982, Ser. No. 440,359
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—48

271,221
WATER WHISTLE
A. Edward Fogarty, and Bonnie R. Fogarty, both of 3513 School Ave., Sarasota, Fla. 33579
Filed Dec. 29, 1980, Ser. No. 220,705
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64

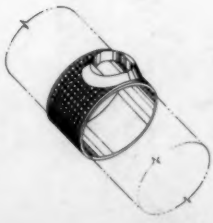
271,222
SPINNING TOY
Merry S. Riehm, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 5, 1982, Ser. No. 346,108
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—92

271,223
TOY SWIVEL CRANE OR SIMILAR ARTICLE
John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Filed Jan. 28, 1981, Ser. No. 229,164
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—132

271,224
PERFORATED ANIMAL FIGURE TOY
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Taira Hanashima, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Apr. 13, 1981, Ser. No. 253,956
Claims priority, application Japan, Oct. 27, 1980, 55-44837
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—154

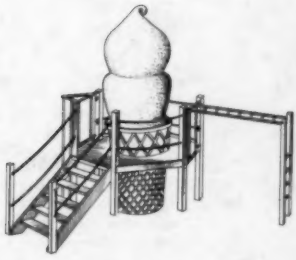
271,225
ANIMAL FIGURE
Donald A. Burrows, 4839 Imperial Dr., Richton Park, Ill. 60471
Filed Dec. 24, 1980, Ser. No. 220,118
Term of patent 14 years
Int. Cl. D21—*01;* D11—*02*
U.S. Cl. D21—159

271,226
GRIP INDEXER FOR SPORTS RACKETS
Mitchell J. Slayman, 30701 Fairgreens West, Laguna Niguel, Calif. 92677
Filed Apr. 20, 1981, Ser. No. 255,772
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—221



271,227
SWIMMING GLOVE
Alicia C. Francisco, Miami, Fla., assignor to Aqua Gloves, Inc., Miami, Fla.
Filed Apr. 6, 1981, Ser. No. 251,516
Term of patent 14 years
Int. Cl. D21—*02;* D2—*06*
U.S. Cl. D21—238

271,228
PLAYGROUND CLIMBER
Valentine J. Zimmerman; Mary H. Abel, both of Galesville, and Lloyd J. Rubbelke, Clintonville, all of Wis., assignors to E. E. Industries Inc., Galesville, Wis.
Filed Nov. 24, 1980, Ser. No. 209,418
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245



271,229
GUN GRIP
Frank A. Pachmayr, Los Angeles, and Jack R. Farrar, Whittier, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.
Filed Sep. 4, 1981, Ser. No. 299,409
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

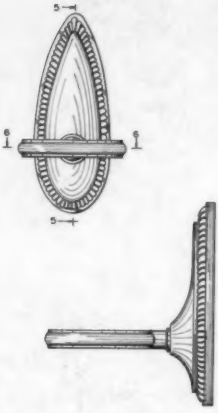
271,230
RIFLE
Wade R. Ingrham, P.O. Box 6422, Midland, Tex. 79701
Filed Dec. 15, 1981, Ser. No. 330,978
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—6

271,231
INSECT LURE
Daniel M. Stout, Kirkwood, Mo., assignor to Whitmire Research Laboratories, Inc., St. Louis, Mo.
Filed Jun. 17, 1981, Ser. No. 274,549
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

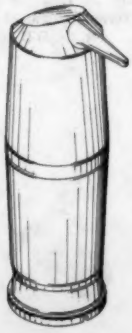
271,232
LIVE BAIT FISHING RIG
Kevin P. Cole, 326-120th La. NW., Coon Rapids, Minn. 55433
Filed Jul. 17, 1981, Ser. No. 284,353
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

271,233
FISHING LURE
David D. Moore, 4970 Birch Ave., Rockford, Ill. 61111
Division of Ser. No. 16,337, Feb. 28, 1979, Pat. No. Des. 261,921. This application Aug. 28, 1981, Ser. No. 297,496
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

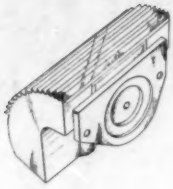
271,234
GLASS HOLDER
Andre Bennato, Paris, France, assignor to Sanistyl Creations-S.A.R.L., Nogent sur Marne, France
Filed Sep. 25, 1980, Ser. No. 190,828
Claims priority, application France, Mar. 26, 1980, 800981
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—93



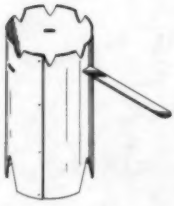
271,235
WATER FILTER
Raymond E. Ward, 3716 E. Main, Mesa, Ariz. 85202
Filed Feb. 2, 1981, Ser. No. 231,226
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



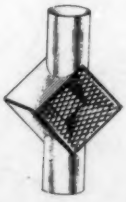
271,236
SEMI-AUTOMATIC BAILER PLUG
William C. Patriarca, Annandale, Va., and Leonard J. McGraw, Pittsburgh, Pa., assignors to PAT-N-MAC, Largo, Md.
Filed Oct. 1, 1980, Ser. No. 175,394
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—19



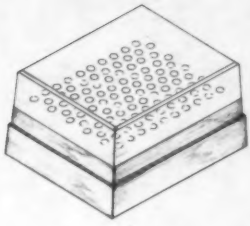
271,237
CHARCOAL STACK LIGHTER
Robert G. Palmer, deceased, late of Easton, Pa.; by Mrs. Robert G. Palmer, representative, Box 402 R.D. #4, Easton, Pa. 18042, and Frank Rose, 112 River Rd., Bldg. 1, Clifton, N.J. 07014
Filed Apr. 27, 1981, Ser. No. 257,826
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—90.1



271,238
PASSIVE HEAT EXCHANGER
Benjamin L. Valencia, 38½ B New York St., Dover, N.H. 03820
Filed Aug. 13, 1981, Ser. No. 292,508
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136

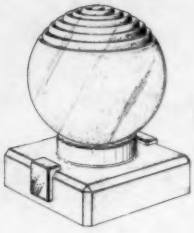


271,239
CONTAINER AND RACK FOR PIPETTE TIPS OR SIMILAR ARTICLE
David J. Lemieux, Middleton, Mass., and Kenneth Rainin, Piedmont, Calif., assignors to Rainin Instrument Co., Inc., Woburn, Mass.
Filed Apr. 3, 1981, Ser. No. 250,139
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—32

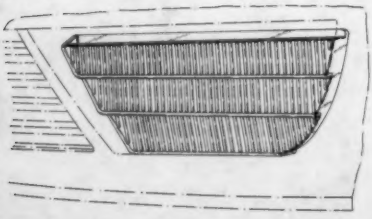


271,240
COMBINED FLASHLIGHT AND FLUORESCENT LANTERN
Shun Yau Tang, Hong Kong, Hong Kong, assignor to Accel Manufacturing Limited, Kowloon, Hong Kong
Filed Feb. 25, 1981, Ser. No. 238,173
Claims priority, application United Kingdom, Sep. 1, 1980, 996372
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—42

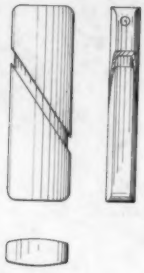
271,241
LIGHTING FIXTURE
Guy Vrignaud, Grenoble, France, assignor to Allibert S.A., Grenoble, France
Filed Feb. 4, 1981, Ser. No. 231,349
Claims priority, application Hague, Aug. 18, 1980, DM/000 314
Term of patent 14 years
Int. Cl. D26—*104, 05*
U.S. Cl. D26—85



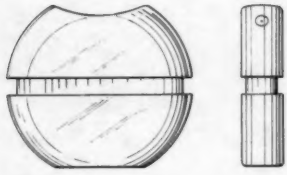
271,242
FOGLIGHT LENS
Werner Heinz, Tiefenbronn; Arno Jambor, Vaihingen, and Adolf Schmidt, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Aug. 13, 1980, Ser. No. 177,713
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 5118
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—122



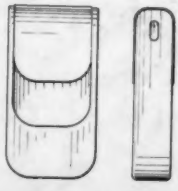
271,243
SPRAY
Carlos M. Martinez, Barcelona, Spain, assignor to Monturas Y Fornituras, S.A., Barcelona, Spain
Filed Jul. 22, 1981, Ser. No. 285,774
Claims priority, application Spain, Feb. 14, 1981, 98,814
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—91.1



271,244
SPRAY
Carlos M. Martinez, Barcelona, Spain, assignor to Monturas Y Fornituras, S.A., Barcelona, Spain
Filed Jul. 22, 1981, Ser. No. 285,775
Claims priority, application Spain, Feb. 14, 1981, 98,814
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—91.1



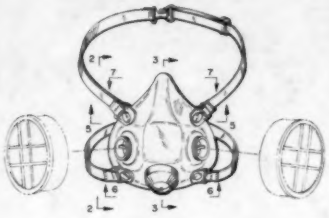
271,245
SPRAY
Carlos M. Martinez, Barcelona, Spain, assignor to Monturas Y Fornituras, S.A., Barcelona, Spain
Filed Jul. 22, 1981, Ser. No. 285,776
Claims priority, application Spain, Feb. 14, 1981, 98,814
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—91.1



271,246
COMBINED RESPIRATOR FACE PIECE AND STRAP UNITS

James N. Matheson, Mission Viejo, and Philip J. Lowry, Costa Mesa, both of Calif., assignors to U.S.D. Corp., Santa Ana, Calif.

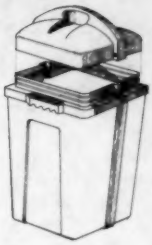
Filed Mar. 2, 1981, Ser. No. 239,693
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D29—7



271,247
TRASH CAN WITH LID

Norman C. Lee, Greensboro, N.C., assignor to Zarn, Inc., Reidsville, N.C.

Filed Oct. 19, 1981, Ser. No. 312,519
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D34—07



271,248
TRASH CONTAINER

Dale T. Maza, Frederick County; Glen E. Tomblin, and Harold E. Ruckman, both of Winchester, all of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Apr. 1, 1982, Ser. No. 364,450
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Int. Cl. D7—*07*
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TO WHOM

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Baynes, William R., to Turco Manufacturing Co. Saddle for bar and bar-type weight. 4,412,678., Cl. 272-123.000.
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Blechner, Charles. Dental articulator with removable tray. 4,412,822., Cl. 433-60.000.

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Bottom, Dudley, Jr. Demand reduction system for regulated electric utility distribution circuits. 4,413,189., Cl. 307-31.000.

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Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., to Delalande S.A. N-Aryl oxazolidinones, oxazolidinethiones, pyrrolidinones, pyrrolidines and thiazolidinones. 4,413,001., Cl. 424-272.000.

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Brenneman, William L., to Olin Corporation. Cooperative rolling mill apparatus and process. 4,412,439., Cl. 72-41.000.

Brenner, Walter, to Standard Products Company, The. Radiation curable adhesive compositions and composite structures. 4,413,019., Cl. 427-36.000.

Bresowar, Gerald E.; and Benton, Thomas K., to Combustion Engineering, Inc. Sonic atomizing spray nozzle. 4,412,653., Cl. 239-102.000.

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Brown, Dale M.; and Vosburgh, Kirby G., to General Electric Company. Method of making integrated circuits utilizing ion implantation and selective epitaxial growth. 4,412,868., Cl. 148-1.500.
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Brown, Jack, to Singer Company, The. Vented pneumatic foot controller. 4,413,214., Cl. 318-488.000.
Brown, Vernon L., to Bell Telephone Laboratories, Incorporated. Printed wiring board construction. 4,413,308., Cl. 361-398.000.
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Brummond, Gerald G.; Klein, Paul E.; and Anderson, Roland M., to Modcom, Inc. Orthodontic tension-applying apparatus. 4,412,820., Cl. 433-18.000.
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, to Ciba-Geigy Corporation. Herbicidal heterocyclic and substituted phenyl phenylacetylene amines. 4,412,856., Cl. 71-121.000.
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Staerzl, Richard E., 4,413,248., Cl. 340-52.00R.
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Bucy, James D. Table mounted stop gauge for a cutoff saw. 4,412,468., Cl. 83-468.000.
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Cadle, Terence M.: *See*—
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Kramer, Louis T.; Butler, Franklin H.; and Callas, Donald C., 4,412,665., Cl. 244-102.00R.
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Stenberg, Kaj O.; and Nystrom, Lars H., 4,412,793., Cl. 417-477.000.
Cameron, John, to Queen's University at Kingston. Electro-slag welding process for irregular sections. 4,413,169., Cl. 219-73.100.
Camin, Larry R.: *See*—
Kling, John E.; Camin, Larry R.; and Scott, Douglas W., 4,412,832., Cl. 604-164.000.
Campanini, Sergio. Swivel hose coupling with threaded nipple. 4,412,693., Cl. 285-39.000.
Campbell, Jack B.; and Lavagnino, Edward R., to Eli Lilly and Company. Preparation of isoquinoline derivatives useful as immune regolants. 4,413,126., Cl. 546-52.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Leveson, Richard C.; and Barker, Nicholas J., 4,413,185., Cl. 250-423.00P.
Canadian Forest Products Ltd.: *See*—
Chow, Suezone, 4,413,023., Cl. 427-325.000.
Cannon, James L. Orthodontic arch wire. 4,412,819., Cl. 433-20.000.
Canon Denshi Kabushiki Kaisha: *See*—
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295., Cl. 360-110.000.
Canon Kabushiki Kaisha: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,413,045., Cl. 430-59.000.
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295., Cl. 360-110.000.
Sakane, Toshio; Madate, Haruhisa; and Kohayakawa, Yoshimi, 4,412,728., Cl. 351-206.000.
Suntola, Tuomo S.; Pakkala, Arto J.; and Lindfors, Sven G., 4,413,022., Cl. 427-255.200.
Tsukata, Masaharu; and Murakami, Koichi, 4,412,735., Cl. 355-14.00R.
Capitani, Enzo; and Teissie, Jean, to Societe Centrale de l'Uranium et des Minerais et Metaux Radioactifs Scumra. Process and apparatus for extracting ions from a clear liquid or a liquid containing materials in suspension by contact with an exchange substance. 4,412,923., Cl. 210-661.000.
Capitol Packaging Corporation: *See*—
Wise, Frederick M.; and DeWitt, Carl F., 4,412,661., Cl. 242-77.400.
Card, Lorin P.; and Borsting, Otto W. Fail-safe actuator and hydraulic system incorporating the same. 4,412,670., Cl. 251-14.000.
Cardiff, Raymond S. Directional outlet assembly. 4,412,480., Cl. 98-40.00D.
Carl Freudenberg, Firma: *See*—
Hartwig, Peter, 4,412,901., Cl. 204-192.00C.
Carl Still GmbH & Co. KG, Firma: *See*—
Abendroth, Werner, 4,412,891., Cl. 202-248.000.
Carlo, Dennis J.; Nollstadt, Karl H.; Stoudt, Thomas H.; and Maigetter, Robert Z., to Merck & Co., Inc. Group B streptococcal capsular polysaccharides. 4,413,057., Cl. 435-101.000.
Carnaghi, Arturo A., to Angelica Corporation. Hook-like end for drawstring. 4,412,369., Cl. 24-266.000.

Carnevale, Anthony; Paek, Un-Chul; and Peterson, George E., to Western Electric; and Bell Telephone Laboratories Incorporated. Single mode fiber with graded index of refraction. 4,412,722., Cl. 350-96.310.

Carr, Peter, to Energy Development Associates, Inc. Hydrogen/halogen reactor system for metal halogen batteries. 4,413,040., Cl. 429-19.000.

Carr, Peter, to Energy Development Associates, Inc. Inert gas rejection system for metal halogen batteries. 4,413,042., Cl. 429-51.000.

Carrier Corporation: *See—*
Brendel, Thomas E., 4,412,432., Cl. 62-504.000.

Carroll, Clarence T.: *See—*
Slater, Billy R.; Simpson, Dennis W.; and Carroll, Clarence T., 4,413,314., Cl. 364-188.000.

Carvalho Fangueiro, Raul C.: *See—*
Pedrosa Junior, Oswaldo A.; Castro Couto, Nilton; and Carvalho Fangueiro, Raul C., 4,412,811., Cl. 431-202.000.

Cascio, Jack: *See—*
Ivanov, Konstantin; and Cascio, Jack, 4,412,614., Cl. 206-63.300.

Cassella Aktiengesellschaft: *See—*
Tappe, Horst; and Wille, Herbert, 4,413,144., Cl. 568-306.000.

Cassidy, Edward L.: *See—*
Safrit, Sam C.; Cassidy, Edward L.; and Euliss, Melvin C., 4,412,433., Cl. 66-177.000.

Castanon, Jorge B.: *See—*
Viramontes-Brown, Ricardo; and Castanon, Jorge B., 4,412,858., Cl. 75-38.000.

Castro Couto, Nilton: *See—*
Pedrosa Junior, Oswaldo A.; Castro Couto, Nilton; and Carvalho Fangueiro, Raul C., 4,412,811., Cl. 431-202.000.

Cavil, David T.; and Krueger, William R., to Outboard Marine Corporation. Marine trim and tilt positioning system. 4,413,215., Cl. 318-588.000.

Cavitron Inc.: *See—*
Gallant, Ben J., 4,412,402., Cl. 51-439.000.

CDM Connectors Development & Mfg. AG: *See—*
Pfister, Max, 4,412,718., Cl. 339-256.00R.

Cellitti, Raymond A.; and Connelly, John J., to International Harvester Co. Method and apparatus for determining the cooling characteristics of a quenching medium. 4,412,752., Cl. 374-43.000.

Centronics Data Computer Corp.: *See—*
Hein, Richard A., 4,413,267., Cl. 346-75.000.

Cerwin, Robert J., to Ethicon, Inc. Ligating clip package. 4,412,617., Cl. 206-339.000.

Ceske zavody motocykove, narodni podnik: *See—*
Pudil, Frantisek; and Trhlik, Jaromir, 4,412,596., Cl. 180-227.000.

Chadwick, Joseph H.: *See—*
Weaver, Charles S.; and Chadwick, Joseph H., 4,413,289., Cl. 360-51.000.

Chadwick, Kenneth E.; Chia, E. Henry; Ogletree, Robert H.; Powers, Frank M.; and Richardson, Larry S., to Southwire Company. Cooling apparatus for wheel-band continuous casting machines. 4,412,580., Cl. 164-433.000.

Chaillie, Charles; and Reisinger, Konrad, to Siemens Aktiengesellschaft. Process for transmitting data with the aid of a start-stop signal. 4,413,336., Cl. 370-48.000.

Champion International Corporation: *See—*
Fremont, Henry A., 4,412,888., Cl. 162-54.000.
Lepisto, J. George, 4,412,645., Cl. 383-48.000.

Chan, Hak-Foon: *See—*
Miller, George A.; and Chan, Hak-Foon, 4,413,003., Cl. 424-273.00R.

Chan, Rosalind P. K., to Biorex Laboratories Limited. 2-Hydroxy-5-phenylazobenzoic acid derivatives and method of treating ulcerative colitis therewith. 4,412,992., Cl. 424-226.000.

Chang, Wen-Hsuan; Lee, Kyu-Wang; and Saunders, John B., Jr., to PPG Industries, Inc. Coating compositions containing organosilane-polyol. 4,413,086., Cl. 524-386.000.

Chao, Hu H.; and Dennard, Robert H., to International Business Machines Corporation. Apparatus for the reduction of the short-channel effect in a single-polysilicon, one-device FET dynamic RAM array. 4,413,330., Cl. 365-205.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Yundt, George B.; and Curtiss, William P., 4,413,223., Cl. 322-32.000.

Chaude, Odile: *See—*
Ballerini, Daniel; Chaude, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastele, Jean-Paul, 4,412,925., Cl. 252-8.55D.

Chauveteau, Guy: *See—*
Ballerini, Daniel; Chaude, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastele, Jean-Paul, 4,412,925., Cl. 252-8.55D.

Cheary, Clifford M.; Lancaster, David J.; and Smith, Paul P., to Dunlop Limited. Ignition systems. 4,413,303., Cl. 361-253.000.

Chemische Werke Huls AG: *See—*
Disteldorf, Josef; Gras, Rainer; and Schnurbusch, Horst, 4,413,079., Cl. 524-169.000.

Chemla, Daniel S.; Oudar, Jean-Louis; and Tsoucaris, Georges. Nitropyridine-N-oxide molecular crystals. 4,413,128., Cl. 546-312.000.

Chen, Edward S.; and Baldauf, William, to United States of America, Army. Pretreatment of superalloys and stainless steels for electroplating. 4,412,892., Cl. 204-34.000.

Chenard, Jean-Yves: *See—*
Kornbaum, Simon; and Chenard, Jean-Yves, 4,412,897., Cl. 204-159.200.

Chester, Ian R.; Powell, Lawson W.; and Roberts, David G., to Beecham Group Limited. Process for the preparation of penicillins and penicillin derivatives. 4,413,056., Cl. 435-43.000.

Chia, E. Henry: *See—*
Chadwick, Kenneth E.; Chia, E. Henry; Ogletree, Robert H.; Powers, Frank M.; and Richardson, Larry S., 4,412,580., Cl. 164-433.000.

Chikaraishi, Takayo: *See—*
Ishii, Katsumi; and Chikaraishi, Takayo, 4,412,696., Cl. 292-336.300.

Chikashige, Kiyoshi, to Kabushiki Kaisha Medos Kenkyusho. Suction device for endoscope. 4,412,531., Cl. 128-4.000.

Chilton, John P.: *See—*
Fray, Derek J.; Chilton, John P.; and Cooke, Arthur V., 4,412,893., Cl. 204-105.00R.

Chow, Peter C. M., to Grove Valve and Regulator Company. Fire safe expansible tube type valve. 4,412,554., Cl. 137-375.000.

Chow, Suezone, to Canadian Forest Products Ltd. Method of treating wood to prevent stain and decay. 4,413,023., Cl. 427-325.000.

Christie Electric Corporation: *See—*
Benjamin, Fred; and Heil, Robert H., 4,413,221., Cl. 320-48.000.

Chromasonics, Inc.: *See—*
Beretsky, Irwin; Arnold, David E.; and Pellegrini, Bruno, 4,412,544., Cl. 128-660.000.

Chugai Denki Kogyo K.K.: *See—*
Shibata, Akira, 4,412,971., Cl. 420-501.000.

Chung, Stanley Y.; and Spadini, Gianfranco L., to Procter & Gamble Company, The. Bleaching compositions. 4,412,934., Cl. 252-186.380.

Ciba-Geigy Corporation: *See—*
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,412,856., Cl. 71-121.000.
Drabek, Jozef; and Boger, Manfred, 4,413,008., Cl. 424-298.000.
Fu, Frank T.; and Winter, Roland A. E., 4,413,096., Cl. 525-204.000.
Green, George E.; Losert, Ewald; and Paul, John G., 4,413,052., Cl. 430-327.000.
Hoegerle, Karl; and Ohnemus, Kurt, 4,413,124., Cl. 544-319.000.
Vogel, Christian; and Aebi, Rudolf, 4,412,855., Cl. 71-118.000.

Cicuttini, Amelio, to CPC International Inc. Wet milling of starch bearing materials with water recycle after reverse osmosis or ultrafiltration. 4,412,867., Cl. 127-66.000.

Cioca, Gheorghe, to Seton Company. Collagen sponge. 4,412,947., Cl. 260-123.700.

Ciomo, George C.: *See—*
Abramson, Alan; Ciomo, George C.; Davis, Gershon J.; and Weil, Edward D., 4,412,956., Cl. 260-429.00R.

Cities Service Company: *See—*
Bouck, Larry S., 4,412,585., Cl. 166-248.000.

Claassen, Peter: *See—*
Krempl, Peter; Claassen, Peter; and List, Helmut, 4,413,202., Cl. 310-338.000.

Claesson, Kjell; Ronnerholm, Stig; and Strand, Rolf, to Tour & Andersson Aktiebolag. Arrangement in climatization systems. 4,412,649., Cl. 236-46.00R.

Clarion Co., Ltd.: *See—*
Sato, Yasuhiko; Sakai, Takamasa; and Minagawa, Shoichi, 4,412,906., Cl. 204-298.000.

Clark Equipment Company: *See—*
Ackerman, LaVern L., 4,412,612., Cl. 198-697.000.

Clark, Thomas A. Splitting axe. 4,412,572., Cl. 145-2.00R.

Cleaveland, Edwin E., III: *See—*
Ahern, Douglas K.; and Cleaveland, Edwin E., III, 4,412,738., Cl. 355-76.000.

Clement, Heinz; and Furrer, Christina, to Rieter Machine Works Limited. Electric stop motion apparatus for a textile machine. 4,412,367., Cl. 19-0.250.

Clements, John L.; and Magnusson, Stig E., to GTE Automatic Electric Labs Inc. Fault recovery apparatus for a PCM switching network. 4,413,335., Cl. 370-16.000.

Clineschmidt, Bradley V.: *See—*
Remy, David C.; and Clineschmidt, Bradley V., 4,412,999., Cl. 424-267.000.

Clitherow, John W., to Glaxo Group Limited. Intermediates in the preparation of ranitidine. 4,413,135., Cl. 549-495.000.

CMD Enterprise, Inc.: *See—*
Taylor, Noel R.; and Taylor, Paul A., 4,413,218., Cl. 318-771.000.

Cochrane, Sydney D. B.: *See—*
Barnett, John S.; and Cochrane, Sydney D. B., 4,412,569., Cl. 144-3.00D.

Cohen, Martin G.; and Liu, Kuo-ching, to Quantronix Corporation. Method and apparatus for frequency doubling a laser beam. 4,413,342., Cl. 372-22.000.

Cohen, Sherman E.; Ramazzotti, Dario; and Hartley, Michael D., to Nordson Corporation. Fluid level indicator. 4,413,255., Cl. 340-622.000.

Coker, Earnest Z. Dredging suction-jet head. 4,412,394., Cl. 37-57.000.

Coldelite Corporation of America: *See—*
Giannella, Frank; and Pellicciari, Enzo E., 4,412,428., Cl. 62-308.000.

Coles Cranes Limited: *See—*
Gyomrey, Karl M., 4,412,622., Cl. 212-187.000.

Colgate-Palmolive Company: *See—*
Mitchell, Robert L., 4,412,983., Cl. 424-52.000.

Collins, David J.; and Van Doren, James E., to General Electric Company. Rate initial pressure limiter. 4,412,780., Cl. 415-17.000.

Collins, John H.; Lin, Mei-Jan L.; and Kekish, George T., to Nalco Chemical Company. Stable oil dispersible magnesium hydroxide slurries. 4,412,844., Cl. 44-51.000.
Collins, Robert J.; and Feigl, Erich F. Vending machine with improved means for dispensing products at a predetermined price. 4,412,607., Cl. 194-1.00D.
Colvin, Jack A.; and McClellan, John M., to General Motors Corporation. In-line engine cranking motor drive having reduction gear set. 4,412,457., Cl. 74-7.00A.
Combes, Gilles, to Societe Anonyme dite: Alsthom-Atlantique. Over pressure release valve for a hydraulic installation. 4,412,555., Cl. 137-524.000.
Combustion Engineering, Inc.: *See—*
Bresowar, Gerald E.; and Benton, Thomas K., 4,412,653., Cl. 239-102.000.
Perry, Glenn M.; and Sullivan, Robert P., 4,412,510., Cl. 122-510.000.
Commonwealth of Australia: *See—*
Manners, Vincent J., 4,413,354., Cl. 378-81.000.
Compagnie Generale de Radiologie: *See—*
Amedro, Albert; Audemard, Bernard; and De Mul, Rene, 4,413,231., Cl. 324-220.000.
Comstedt, Anders P. P.: *See—*
Elfner, Bo A.; and Comstedt, Anders P. P., 4,413,325., Cl. 364-557.000.
Connelly, John J.: *See—*
Cellitti, Raymond A.; and Connelly, John J., 4,412,752., Cl. 374-43.000.
Conoco Inc.: *See—*
Sifferman, Thomas R., 4,412,586., Cl. 166-294.000.
Consiglio Nazionale Delle Ricerche: *See—*
Piancatelli, Giovanni; Scettri, Arrigo; and Maurizio, D'Auria, 4,413,145., Cl. 568-345.000.
Conte, Louis B., Jr.; and Reichle, Walter T., to Union Carbide Corporation. Solution synthesis of 1,3,5-triacrylylhexahydro-s-triazine. 4,413,123., Cl. 544-215.000.
Continental Group, Inc., The: *See—*
York, Stuart A., 4,412,807., Cl. 425-564.000.
Conway, William H.: *See—*
Tyler, Hugh J.; and Conway, William H., 4,413,252., Cl. 340-365.00C.
Cook, Jeffrey J. Combination can opening tool. 4,412,464., Cl. 81-3.10R.
Cooke, Arthur V.: *See—*
Fray, Derek J.; Chilton, John P.; and Cooke, Arthur V., 4,412,893., Cl. 204-105.00R.
Cooper, Gary D. Elevator storage system. 4,412,601., Cl. 187-27.000.
Copeland Corporation: *See—*
Lal, Mahendra, 4,412,791., Cl. 417-312.000.
Copelin, Harry B.: *See—*
Ernst, Richard E.; and Copelin, Harry B., 4,413,136., Cl. 549-509.000.
Coplan, Myron J.; and Gotz, Gertrud, to Albany International Corp. Heterogeneous sulfonation process for difficultly sulfonatable poly(ether sulfone). 4,413,106., Cl. 525-534.000.
Cordis Dow Corp.: *See—*
Kell, Michael J., 4,412,916., Cl. 210-90.000.
Corning Glass Works: *See—*
Palmquist, Ronald W., 4,413,346., Cl. 373-41.000.
Costa, Bruno, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Optical system coupling a rectangular light source to a circular light receiver. 4,412,720., Cl. 350-96.180.
Cottell, Eric C. Fuel supply system. 4,412,512., Cl. 123-25.00E.
Cottell, Eric Charles: *See—*
Klayer, Charles W., 4,412,842., Cl. 44-1.0SR.
Country Baked Hams, Inc.: *See—*
Hoegh, Poul E., 4,412,483., Cl. 99-538.000.
Cowden, Robert E.: *See—*
Yates, Wesley E.; Cowden, Robert E.; Akesson, Norman B.; and Horgan, Paul M., 4,412,654., Cl. 239-171.000.
Cowles, Stephen E.: *See—*
Blue, William; Bruce, George I. C.; and Cowles, Stephen E., 4,413,316., Cl. 364-200.000.
CPC International Inc.: *See—*
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Craig, George H.: *See—*
Du Broff, William; Craig, George H.; and Veslocki, Timothy A., 4,412,841., Cl. 44-10.00C.
Crawford, Roger; and Sanders, Duane, to Thermoguard Insulation Co. Shredding mill. 4,412,659., Cl. 241-35.000.
Creech, Edward T.: *See—*
Wallace, Steven A.; Creech, Edward T.; and Northcutt, Walter G., 4,412,860., Cl. 75-84.000.
Crinos Farmacologica Spa: *See—*
Reiner, Alberto, 4,412,996., Cl. 424-256.000.
Crockett, Charles R., to Teccor Electronics, Inc. Optically coupled solid state relay. 4,413,193., Cl. 307-311.000.
Crounse, Nathan N., to Sterling Drug Inc. Monoazo and disazo colorants. 4,412,950., Cl. 260-157.000.
Crowe, Norman P.: *See—*
Molitor, Edwin A.; Crowe, Norman P.; and Lampe, Guy W., 4,412,775., Cl. 414-626.000.
Cruz-Uribe, Antonio S.; and Di Giulio, Peter C., to Pitney Bowes Inc. Print material supply control apparatus and method. 4,413,264., Cl. 346-1.100.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Costa, Bruno, 4,412,720., Cl. 350-96.180.
Cue, Berkeley W., Jr.; and Moore, Bernard S., to Pfizer Inc. Stereospecific synthesis of 5-phenyl-2S-pentanol. 4,412,958., Cl. 260-456.00R.
Curry, M. Elaine: *See—*
Tihon, Claude; and Curry, M. Elaine, 4,413,059., Cl. 435-286.000.
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Yundt, George B.; and Curtiss, William P., 4,413,223., Cl. 322-32.000.
Cuschera, Casper. Button actuated pop up drain fitting. 4,412,361., Cl. 4-286.000.
Cutter Laboratories, Inc.: *See—*
Lundblad, John L.; Budinger, Miriam D.; and Schwartz, Richard S., 4,412,990., Cl. 424-177.000.
Cynex Manufacturing Corporation: *See—*
Green, Dan; and Goldner, Sandor, 4,413,217., Cl. 318-729.000.
Czerniewicz, John F. Power chisel. 4,412,571., Cl. 144-219.000.
D C L Microelectronics, Inc.: *See—*
Laflamme, Daniel C., 4,412,473., Cl. 84-485.00R.
Daesen, Robert H. C. M., to Dart Industries Inc. Container closure alignment device. 4,412,630., Cl. 220-353.000.
Dahm, Manfred: *See—*
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Dai-Ichi High Frequency Co., Ltd.: *See—*
Kawanami, Shumpei; Watanabe, Yasuo; and Hanyo, Susumu, 4,412,442., Cl. 72-128.000.
Daicel Chemical Industries, Ltd.: *See—*
Haga, Mitsunobu; and Omori, Yasuzi, 4,413,025., Cl. 427-387.000.
Daido Metal Co., Inc.: *See—*
Mori, Sanae, 4,412,972., Cl. 420-530.000.
Daimler-Benz Aktiengesellschaft: *See—*
Burckhardt, Manfred, 4,412,701., Cl. 303-6.00R.
Daly, Jeffery E., to Reed Rock Bit Company. Rock bit internal lubricant pump. 4,412,590., Cl. 175-229.000.
Damin, Bernard; Forestiere, Alain; and Sillion, Bernard, to Institut Francais du Petrole. Process for manufacturing chlorolactones from unsaturated carboxylic acids. 4,413,133., Cl. 549-265.000.
Danford, Glenn S. Automatic call forwarding telephone apparatus. 4,413,158., Cl. 179-90.0BD.
Danfoss A/S: *See—*
Iversen, Kristian; and Hansen, Henning, 4,412,581., Cl. 165-29.000.
Thomsen, Svend E.; and Kyster, Erik, 4,412,415., Cl. 60-384.000.
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Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201., Cl. 310-260.000.
Darby, Jack B. Control means for shifting gears on dual shift bicycles. 4,412,828., Cl. 474-81.000.
Dart Container Corporation: *See—*
Dart, William A.; and Dart, Kenneth B., 4,412,629., Cl. 220-90.400.
Dart Industries Inc.: *See—*
Daenen, Robert H. C. M., 4,412,630., Cl. 220-353.000.
Dart, Kenneth B.: *See—*
Dart, William A.; and Dart, Kenneth B., 4,412,629., Cl. 220-90.400.
Dart, William A.; and Dart, Kenneth B., to Dart Container Corporation. Non-spill drink-through lid. 4,412,629., Cl. 220-90.400.
Datamarc, Inc.: *See—*
Berger, Michael A., 4,412,637., Cl. 226-172.000.
Dauphin, Jean-Louis; Louvet, Olivier F.; and Pitie, Jean-Marc. Time division switching system for circuit mode and packet mode lines. 4,413,337., Cl. 370-58.000.
Davies, Glyndwr J., to Glacier Metal Company Limited, The. Polyarylene sulphide compositions. 4,413,083., Cl. 524-299.000.
Davies, Robert B., to Motorola, Inc. Voltage regulator circuit. 4,413,226., Cl. 323-303.000.
Davis, Gershon J.: *See—*
Abramson, Alan; Ciomo, George C.; Davis, Gershon J.; and Weil, Edward D., 4,412,956., Cl. 260-429.00R.
Davis, Murray A. Ship-burne oil dispersant procedure and apparatus. 4,412,501., Cl. 114-270.000.
De Bar, David E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., to International Business Machines Corporation. Fabrication method for vertical PNP structure with Schottky barrier diode emitter utilizing ion implantation. 4,412,376., Cl. 29-576.00B.
Deem, Brian C.; and Reitz, Richard J., to Bendix Corporation, The. Engine fan clutch. 4,412,605., Cl. 192-82.00T.
Degesch: *See—*
Horn, Franziskus; and Fluck, Ekkehard, 4,412,979., Cl. 423-299.000.
DeGrose, Louis. Water tempering system. 4,412,526., Cl. 126-365.000.
Degussa Aktiengesellschaft: *See—*
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Kummel, Friedrich; Hennecke, Rudolf; and Schubert, Manfred, 4,412,757., Cl. 404-113.000.
Demachi, Takuya: *See—*
Kato, Mitsukuni; Demachi, Takuya; Hagii, Hidehiko; and Arai, Takeshi, 4,413,148., Cl. 568-578.000.
Dementhon, Daniel, to Tracor Hydronautics, Incorporated. Wave energy converter. 4,412,417., Cl. 60-497.000.

Demoures, Bernard; and Le Coent, Jean-Louis, to Orogil Corporation. Process for the preparation of superalkalinized metallic detergent-dispersants for lubricating oils and products obtained therefrom. 4,412,927., Cl. 252-33.300.

De Mul, Rene: *See*—
Amedro, Albert; Audemard, Bernard; and De Mul, Rene, 4,413,231., Cl. 324-220.000.

Dennard, Robert H.: *See*—
Chao, Hu H.; and Dennard, Robert H., 4,413,330., Cl. 365-205.000.

Dennis, Silas P., Jr.; and Dennis, Tony M. Apparatus and method for operating a brick kiln. 4,412,814., Cl. 432-146.000.

Dennis, Tony M.: *See*—
Dennis, Silas P., Jr.; and Dennis, Tony M., 4,412,814., Cl. 432-146.000.

Dennison Manufacturing Company: *See*—
Beaudet, Leo A.; and Lennon, Donald J., 4,413,049., Cl. 430-126.000.

Derringer, John G., to General Motors Corporation. Vehicle parking brake actuating mechanism. 4,412,458., Cl. 74-512.000.

DeSanto, Ronald F., to Warlick, Lehigh Steck. Cylinder-mounted cutter. 4,412,467., Cl. 83-346.000.

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Feinbloom, Richard E., 4,413,278., Cl. 358-93.000.

Dessau, Ralph M., to Mobil Oil Corporation. Diels-Alder cyclodimerization over a carbon molecular sieve catalyst. 4,413,154., Cl. 585-366.000.

Deubzer, Bernward; Egerter, Norbert; and Frey, Volker, to Wacker-Chemie GmbH. Process for preparing organopolysiloxanes and copolymers thereof. 4,413,104., Cl. 525-479.000.

DeVere, James W.: *See*—
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DeWitt, Carl F.: *See*—
Wise, Frederick M.; and DeWitt, Carl F., 4,412,661., Cl. 242-77.400.

Dhein, Rolf: *See*—
Reuter, Knud; Dhein, Rolf; and Fleiter, Lothar, 4,413,116., Cl. 528-307.000.

Diaz, Stephen H., to Raychem Corporation. Mass connector device. 4,413,028., Cl. 428-36.000.

Di Battista, Piero, to Montedison S.p.A. Piperidine polymers and use thereof as stabilizers. 4,413,075., Cl. 524-102.000.

DiBiasi, Daniel J.; and Krutchen, Charles M., to Mobil Oil Corporation. Method and apparatus for measurement and control of cell size in a foam structure. 4,412,961., Cl. 264-40.100.

Didier Engineering GmbH: *See*—
Galow, Manfred; and Stefancik, Nikolaus, 4,412,770., Cl. 414-162.000.

Diesel Kiki Company, Ltd.: *See*—
Iida, Katumi; Sutoh, Shinji; and Hara, Toshizo, 4,412,424., Cl. 62-209.000.
Kondo, Hiroshi; and Shibuya, Tsunenori, 4,412,787., Cl. 417-269.000.
Ohtani, Yoshio; Wakiya, Michio; and Kakishima, Todomu, 4,413,249., Cl. 340-52.00R.

Digital Equipment Corporation: *See*—
Riggle, Charles M.; Weng, Lih-Jyh; and Field, Norman A., 4,413,339., Cl. 371-38.000.

Di Giulio, Peter C.: *See*—
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Dilois, Albert A. Framing assembly. 4,413,035., Cl. 428-397.000.

Dimroth, Peter; and Lotsch, Wolfgang, to BASF Aktiengesellschaft. Pigments comprising cyanomethylquinazolones coupled to diazo compounds prepared from 1-aminoanthroquinones. 4,412,949., Cl. 260-154.000.

Director-General of the Agency of Industrial Science and Technology: *See*—
Sato, Tomio; Okimoto, Kunio; and Yamakawa, Toshio, 4,412,643., Cl. 228-221.000.

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Eberly, Carlyle J., 4,412,743., Cl. 356-237.000.
Morrison, Rocky V., 4,412,805., Cl. 425-549.000.

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Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438., Cl. 72-10.000.

Dr. Boing GmbH & Co. Anlagen und Maschinen KG: *See*—
Witte, Willi; and Boing, Wulf, 4,412,434., Cl. 68-3.00R.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,412,776., Cl. 414-684.300.
Thubeauville, Heinz, 4,412,890., Cl. 202-139.000.

Doerner, Frank. Leg for chair base and cap therefore. 4,412,667., Cl. 248-188.700.

Dofasco Inc.: *See*—
White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815., Cl. 432-206.000.

Doi, Toshitada: *See*—
Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuo; Doi, Toshitada; and Vries, Lodewijk B., 4,413,340., Cl. 371-39.000.

Dolhyj, Serge R.; Velenyi, Louis J.; and Guttmann, Andrew T., to Standard Oil Company, The. Motor fuel additive. 4,412,847., Cl. 44-77.000.

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Donaldson, Terrence L.: *See*—
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Donig, Gerhard; Schmidt, Walter; Schummer, Helmut; and Neulinger, Franz, to Siemens Aktiengesellschaft. Method of operating an electrostatic precipitator. 4,413,225., Cl. 323-246.000.

Donnelly, Edward N.: *See*—
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Dorsey, Robert J. Mold assembly for compressing refractory material and including a quick change mold box. 4,412,800., Cl. 425-195.000.

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Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001., Cl. 424-272.000.

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Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001., Cl. 424-272.000.

Dow Chemical Company, The: *See*—
Flynn, James H.; and McLemore, Donald E., 4,412,448., Cl. 73-81.000.
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Renga, James M.; and Periana-Pillai, Roy A., 4,413,137., Cl. 549-518.000.
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Dowty Electronics Limited: *See*—
Khan, Mohammed N., 4,412,905., Cl. 204-298.000.

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Dravo Corporation: *See*—
Gessler, Donald A., 4,412,976., Cl. 422-270.000.

Dresser Industries, Inc.: *See*—
Adams, Frank, 4,412,795., Cl. 418-86.000.

Drexler, Hermann-Josef; and Poth, Ulrich, to BASF Farben & Fasern A.G. Two-layer metal-effect coating and a process for its production. 4,413,036., Cl. 428-458.000.

Dreyer, Volker: *See*—
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Droscher, Erich: *See*—
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D'Silva, Themistocles D. J., to Union Carbide Corporation. Pesticidal symmetrical N-substituted bis-carbamoyloximino disulfide compounds. 4,413,007., Cl. 424-298.000.

Du-Bro Products, Inc.: *See*—
Broberg, Dewey O., Jr., 4,412,565., Cl. 140-123.000.

Du Broff, William; Craig, George H.; and Veslocki, Timothy A., to Inland Steel Company. Compacted carbonaceous shapes and process for making the same. 4,412,841., Cl. 44-10.00C.

Ducharme, Ronald L.; and Taylor, Robin, to Interlake, Inc. Fork truck battery charging system. 4,413,219., Cl. 320-15.000.

Duerig, Thomas: *See*—
Albrecht, Joachim; Duerig, Thomas; and Richter, Dag, 4,412,872., Cl. 148-11.50F.

Dufond, Pierre: *See*—
Bitoune, Sylviane; Dufond, Pierre; Herrbach, Francois; and Lecreff, Maurice, 4,413,241., Cl. 333-22.00R.

Duhamel, Claude-Alain, to Librairie Fernand Nathan. Small printing machine. 4,412,489., Cl. 101-212.000.

Dunlop Limited: *See*—
Cheary, Clifford M.; Lancaster, David J.; and Smith, Paul P., 4,413,303., Cl. 361-253.000.

Dunmire, Howard L.: *See*—
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,412,427., Cl. 62-298.000.

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Dunwoodie, Edward H.; and Elston, Ronald W., to Transequip Limited. Structural element. 4,412,756., Cl. 403-363.000.

Du Pont de Nemours, E. I., and Company: *See*—
Aufdermarsh, Carl A., Jr., 4,413,094., Cl. 525-187.000.
Ernst, Richard E.; and Copelin, Harry B., 4,413,136., Cl. 549-509.000.

Gavin, Francis M.; and Kruglewicz, Anne M., 4,413,089., Cl. 524-785.000.
Gramm, Jeffrey S., 4,412,957., Cl. 260-453.700.
Lee, Jerald D.; and Reilly, Charles D., 4,412,744., Cl. 356-319.000.
Spencer, Dudley W. C., 4,412,835., Cl. 604-29.000.
Vosburgh, William G., 4,412,877., Cl. 156-72.000.

Durenec, Peter, to United States of America, Army. Split-cycle cooler with improved pneumatically-driven cooling head. 4,412,423., Cl. 62-6.000.

Durham-Bush, Inc.: *See*—
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Dydyk, Michael, to Motorola Inc. Optimized transmission line switch. 4,413,243., Cl. 333-258.000.

Dye, Robert F., to Shell Oil Company. Evaporation process with liquid entrainment separation. 4,412,887., Cl. 159-47.100.

Dyke, Harry J., to Rockwell International Corporation. Automatic line buildout circuit for digital data transmission. 4,413,240., Cl. 333-17.00R.

Dynamics Research Corporation: *See*—
Thomas, Lowell E., 4,413,051., Cl. 430-312.000.

E.G.O. Regeltechnik GmbH: *See*—
Schilling, Wilfried; Lorenz, Siegberg; and Koch, Friedrich, 4,413,175., Cl. 377-25.000.

Eastman Kodak Company: *See*—
Abbott, Thomas I.; and Jones, Cynthia G., 4,413,053., Cl. 430-502.000.
Ahern, Douglas K.; and Cleaveland, Edwin E., III, 4,412,738., Cl. 355-76.000.
Jeffers, Frederick J., 4,413,296., Cl. 360-113.000.

Eastman Technology Inc.: *See*—
Lemke, James U.; and French, William W., 4,412,379., Cl. 29-603.000.

Eaton Corporation: *See*—
Goscenski, Edward J., Jr., 4,412,459., Cl. 74-711.000.
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Eberly, Carlyle J., to Discovision Associates. Off-axis light beam defect detector. 4,412,743., Cl. 356-237.000.

Eckert, Alton B., Jr.: *See*—
Buan, Danilo P.; and Eckert, Alton B., Jr., 4,412,491., Cl. 101-363.000.

Eckstein, Rolf, to Werkzeugmaschinenfabrik Adolf Waldrich Coburg GmbH & Co. Apparatus for chucking and releasing of a conical shank of a tool or an additional aggregate on tool machines, in particular drilling and milling machines. 4,412,766., Cl. 409-233.000.

Egerter, Norbert: *See*—
Deubzer, Bernward; Egerter, Norbert; and Frey, Volker, 4,413,104., Cl. 525-479.000.

Egitto, Frank D.: *See*—
Wang, David N.; Egitto, Frank D.; and Maydan, Dan, 4,412,885., Cl. 156-643.000.

Eglington, Alfred J., to Beecham Group Limited. β-Lactam antibiotics, their preparation and use. 4,413,000., Cl. 424-269.000.

Eichner, Falk-Jurgen, to Eichner Organisation KG. Magazine assembly for holding information bearing cards and the like. 4,412,621., Cl. 211-58.000.

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Eiermann, Kurt; and Schafer, Wolfgang, to Degussa Aktiengesellschaft. Apparatus for measuring the flow velocities of gases and liquids. 4,412,449., Cl. 73-204.000.

EL-FI Innovationer AB: *See*—
Elfner, Bo A.; and Comstedt, Anders P. P., 4,413,325., Cl. 364-557.000.

Elecompack Company, Ltd.: *See*—
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,412,772., Cl. 414-331.000.

Electricite De France: *See*—
Goldman, Alice; and Le Fur, Daniel, 4,412,960., Cl. 264-22.000.

Elfner, Bo A.; and Comstedt, Anders P. P., to EL-FI Innovationer AB. Methods and apparatuses for determining the temperature of an asynchronous motor. 4,413,325., Cl. 364-557.000.

Eli Lilly and Company: *See*—
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Elston, Ronald W.: *See*—
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Elzinga, Eugene R., Jr., to Exxon Research and Engineering Co. Heat storage window. 4,412,528., Cl. 126-417.000.

Emhart Industries, Inc.: *See*—
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Endress u. Hauser GmbH u. Co.: *See*—
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Energy Development Associates, Inc.: *See*—
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Engelhard Corporation: *See*—
Hatfield, W. Robert; Heck, Ronald M.; and Hsiung, Thomas H., 4,412,859., Cl. 75-83.000.

Enomoto, Hidekazu: *See*—
Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802., Cl. 425-392.000.

Environmental Research Institute of Michigan: *See*—
Fienup, James R., 4,412,719., Cl. 350-3.700.

Erf, W. Gregory. Photographic process of producing photographic prints upon instant print film. 4,413,050., Cl. 430-203.000.

Ergon, Inc.: *See*—
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Erickson Electrical Equipment Company: *See*—
Erickson, Reuben A., 4,413,306., Cl. 361-361.000.

Erickson, Reuben A., to Erickson Electrical Equipment Company. Tamper prevention housing for a watt-hour meter and overload protected switch. 4,413,306., Cl. 361-361.000.

Ermakov, Gennady P.: *See*—
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857., Cl. 75-11.000.

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Ernst, Richard E.; and Copelin, Harry B., to Du Pont de Nemours, E. I., and Company. Purification of tetrahydrofuran. 4,413,136., Cl. 549-509.000.

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Fuchs, Gottfried; Garrecht, Ewald; Rieck, Lothar; Ruppel, Wolfgang; Schwarz, Rudolf; and Siegle, Erich, 4,412,641., Cl. 228-37.000.

Ertl, Dietrich; and Ueberle, Dieter, to Metallgesellschaft Aktiengesellschaft. Process for recovering potassium chloride. 4,412,838., Cl. 23-302.00R.

Ertle, Raymond T., to Stokely-Van Camp, Inc. Method and apparatus for manufacturing improved puffed borax. 4,412,978., Cl. 423-279.000.

Essery, John M.: *See*—
Schmitz, Henry; Kaneko, Takuhi; Essery, John M.; and Doyle, Terrence W., 4,413,134., Cl. 549-332.000.

Essex Group, Inc.: *See*—
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Establissements Eugene Scholtes: *See*—
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Estel Hoogovens B.V.: *See*—
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Ethicon, Inc.: *See*—
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Evanson, Delbert L.: *See*—
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Ewesplint Limited: *See*—
Thomson, Adam R., 4,412,818., Cl. 433-1.000.

Exxon Research and Engineering Co.: *See*—
Elzinga, Eugene R., Jr., 4,412,528., Cl. 126-417.000.
Kimon, Peter M.; and Bertrand, Yves, 4,412,598., Cl. 182-19.000.
Michaelson, Robert C.; Austin, Richard G.; and White, Donald A., 4,413,151., Cl. 568-860.000.
Schucker, Robert C.; and Wheelock, Kenneth S., 4,412,911., Cl. 208-121.000.

Fa. Wilmar Schwabe GmbH & Co.: *See*—
Klessing, Klaus, 4,413,122., Cl. 544-153.000.

Fag Kugelfischer Georg Schafer & Co.: *See*—
Paul, Gunter; Patel, Kirit; and Schmitt, Gunter, 4,412,412., Cl. 57-280.000.

Fagrell, Erik T., to AB Volvo. Folding step for vehicles. 4,412,686., Cl. 280-166.000.

Faulkner, Bobby P.; and Weinecke, Michael H., to Allis-Chalmers Corporation. Process for recovery of oil from shale. 4,412,909., Cl. 208-11.00R.

Feather, Orval R. Water purification system. 4,412,924., Cl. 210-744.000.

Feigl, Erich F.: *See*—
Collins, Robert J.; and Feigl, Erich F., 4,412,607., Cl. 194-1.00D.

Feinbloom, Richard E., to Designs for Vision, Inc. Optical coupling apparatus for coupling an arthoscope to a camera. 4,413,278., Cl. 358-93.000.

Fenicle, Robert D., to Allied Corporation. Dynamoelectric machine with cartridge brush holder. 4,413,200., Cl. 310-239.000.

Ferranti plc: *See*—
Blue, William; Bruce, George I. C.; and Cowles, Stephen E., 4,413,316., Cl. 364-200.000.

Feuerbaum, Hans-Peter, to Siemens Aktiengesellschaft. Arrangement for stroboscopic potential measurements with an electron beam testing device. 4,413,181., Cl. 250-310.000.

Field, Norman A.: *See*—
Riggle, Charles M.; Weng, Lih-Jyh; and Field, Norman A., 4,413,339., Cl. 371-38.000.

Fields, Ellis K.: *See*—
Nimry, Tayseer S.; and Fields, Ellis K., 4,413,115., Cl. 528-189.000.

Fienup, James R., to Environmental Research Institute of Michigan. Method and article having predetermined net reflectance characteristics. 4,412,719., Cl. 350-3.700.

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Fiorini, Mario; and Valentini, Claudio, to Anic S.p.A. Method for preparing L-carnitine. 4,413,142., Cl. 562-567.000.

Firey, Joseph C. Char and oil burning engine. 4,412,511., Cl. 123-23.000.

First, David J.: *See*—
Shaw, David N.; and First, David J., 4,412,788., Cl. 417-280.000.

Fisch, Edwin J., to Shell Oil Company. Selective acid gas removal. 4,412,977., Cl. 423-226.000.

Fischer, Franz, to Trisa Burstenfabrik AG. Electrical tooth cleaner apparatus. 4,413,199., Cl. 310-50.000.

Fischer, Hartmut; and Skaletz, Detlef H., to Hoechst Aktiengesellschaft. Process for the catalytic hydrogenolysis of p-substituted benzaldehyde-dimethylacetals to produce the corresponding benzyl methyl ether derivatives. 4,413,149., Cl. 568-636.000.

Fisher, John R., Jr., to Western Electric Co., Inc. Cast solder leads for leadless semiconductor circuits. 4,412,642., Cl. 228-173.00R.

FitzGerald, Cecil W., to Bendix Corporation, The. Terminal for a capacitor and a method of forming same. 4,413,305., Cl. 361-306.000.

Flavan, David B., Jr.; Jenkins, Merrill M. E., Sr.; White, James S.; and Pate, James E., to Three Rivers Development Corporation. Meat cooking apparatus and method. 4,412,610., Cl. 198-403.000.

Fleiter, Lothar: *See*—
Reuter, Knud; Dhein, Rolf; and Fleiter, Lothar, 4,413,116., Cl. 528-307.000.

Fluck, Ekkehard: *See*—
Horn, Franziskus; and Fluck, Ekkehard, 4,412,979., Cl. 423-299.000.

Flynn, James H.; and McLemore, Donald E., to Dow Chemical Company, The. Blocking test for chlorinated polyethylene. 4,412,448., Cl. 73-81.000.

Foehn, Robert C.: *See*—
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Forberg, Horst; Achtnig, Klaus-Peter; and Stoewe, Anneliese, to Krone GmbH. Device for clamping an insulated cable wire to a terminal element. 4,412,374., Cl. 29-566.400.

Ford Aerospace & Communications Corp.: *See*—
Godwin, Paul K., Jr.; and Honda, Ronald T., 4,413,177., Cl. 250-203.00R.

Ford Motor Company: *See*—
Godwin, Paul K., Jr.; and Honda, Ronald T., 4,413,177., Cl. 250-203.00R.
Horvath, Stanley K., 4,413,084., Cl. 524-315.000.

Ford, Thomas H.; and Sasserath, Arend, to Ammark Corporation; and Hans Sasserath & Co. KG, a part interest. Control valve assembly for steam radiators. 4,412,648., Cl. 236-42.000.

Forestiere, Alain: *See*—
Damin, Bernard; Forestiere, Alain; and Sillion, Bernard, 4,413,133., Cl. 549-265.000.

Formica Limited: *See*—
Gelling, Paul J.; Hunt, James E. B.; and Marshman, John D., 4,413,113., Cl. 528-165.000.

Forney Engineering Company: *See*—
Slater, Billy R.; Simpson, Dennis W.; and Carroll, Clarence T., 4,413,314., Cl. 364-188.000.

Forshee, David J., to Forshee, David J. Engine cradle. 4,412,615., Cl. 206-319.000.

Forslund, Erik T., to Ostbergs Fabriks AB. Device for a felling and gripping unit. 4,412,777., Cl. 414-694.000.

Fossel, Eric T.; and Ingwall, Joanne S., to President and Fellows of Harvard College. Dynamic NMR measurement. 4,413,233., Cl. 324-300.000.

Foster Airdata Systems Inc.: *See*—
Foster, George B.; Gibbs, Paul D.; and Smyser, Michael A., 4,413,322., Cl. 364-448.000.

Foster, George B.; Gibbs, Paul D.; and Smyser, Michael A., to Foster Airdata Systems Inc. Automatic waypoint area navigation system. 4,413,322., Cl. 364-448.000.

Foster Wheeler Energy Corp.: *See*—
Trozzi, Norman K., 4,412,496., Cl. 110-347.000.

Fowler, Harry E.: *See*—
Burke, Michael J.; and Fowler, Harry E., 4,412,558., Cl. 138-38.000.

Fowler, Ricky C. Control circuit for electrical appliances. 4,413,211., Cl. 318-257.000.

Fox, Karl M.: *See*—
Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., 4,412,843., Cl. 44-51.000.

Fozzard, George B., to Phillips Petroleum Company. Liquid extraction of diacetoxybutane with halogenated paraffins. 4,413,140., Cl. 560-248.000.

Fraley, Lowell D.: *See*—
Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., 4,412,975., Cl. 422-197.000.

Francis, Thomas E. Earth clod pulverizer. 4,412,589., Cl. 172-148.000.

Franz, Georg: *See*—
Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg, 4,413,021., Cl. 427-236.000.

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Freiberg, James M., to PPG Industries, Inc. Hinged glass photomask assembly. 4,412,739., Cl. 355-89.000.

Fremont, Henry A., to Champion International Corporation. Wood pulp fiber process and resultant products. 4,412,888., Cl. 162-54.000.

French, William W.: *See*—
Lemke, James U.; and French, William W., 4,412,379., Cl. 29-603.000.

Freudenberg, Carl: *See*—
Hartmann, Ludwig; and Ruzek, Ivo, 4,413,032., Cl. 428-288.000.

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Deubzer, Bernward; Egerter, Norbert; and Frey, Volker, 4,413,104., Cl. 525-479.000.

Freyer, Larry E.: *See*—
Shipley, Randall S.; and Freyer, Larry E., 4,412,939., Cl. 502-115.000.

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Scholz, Manfred; and Fricker, Wolfgang-Peter, 4,412,408., Cl. 52-806.000.

Friedman, Jack S.: *See*—
Schmitt, Wilhelm E., 4,412,365., Cl. 15-184.000.

Fritzenwenger, Josef, to Bayerische Motoren Werke Aktiengesellschaft. Line multicylinder internal combustion engine. 4,412,515., Cl. 123-198.00E.

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Jeannet, Pierre; Froidevaux, Raymond; and Gygax, Claude-Andre, 4,412,751., Cl. 368-276.000.

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Fuji, Hiroshi: *See*—
Kurata, Tonio; and Fuji, Hiroshi, 4,412,850., Cl. 55-130.000.

Fuji Kogyo Company, Limited: *See*—
Miyata, Hideo; and Ishii, Hitoshi, 4,413,024., Cl. 427-370.000.

Fuji Photo Film Co., Ltd.: *See*—
Horiuchi, Hideo; and Yoshida, Kazutaka, 4,413,275., Cl. 358-75.000.
Inagaki, Yoshio; Okazaki, Masaki; and Fujita, Shinsaku, 4,412,951., Cl. 260-202.000.
Kitamoto, Tatsuji; and Shirahata, Ryuji, 4,412,507., Cl. 118-718.000.
Mitsui, Akio; and Nakamura, Kotaro, 4,413,054., Cl. 430-555.000.

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Ozawa, Takashi; and Takenouchi, Mutsuo, 4,413,188., Cl. 250-578.000.

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Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, 4,412,810., Cl. 431-186.000.

Fujimoto, Takanori, to Mitsubishi Denki Kabushiki Kaisha. Magnet ignition device. 4,412,522., Cl. 123-602.000.

Fujinaga, Minoru: *See*—
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039., Cl. 428-643.000.

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Abe, Masahiro; and Fujio, Masayuki, 4,412,781., Cl. 415-53.00R.

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Yamaguchi, Hiroshi; Sekiguchi, Takashi; Tsukahara, Hideyuki; Negishi, Nobumasa; and Fujita, Kisuke, 4,412,809., Cl. 431-76.000.

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Fujitsu Fanuc Limited: *See*—
Kurakake, Mitsuo, 4,413,315., Cl. 364-200.000.
Onuki, Tadayoshi, 4,413,176., Cl. 235-445.000.

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Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187., Cl. 250-491.100.
Mochizuki, Hirohiko; Nakano, Masao; Baba, Fumio; Nakano, Tomio; and Takemae, Yoshihiro, 4,413,272., Cl. 357-65.000.
Sumi, Hideji; and Kokado, Masayuki, 4,413,300., Cl. 361-98.000.
Takagi, Mikio; and Kamioka, Hajime, 4,412,388., Cl. 34-1.000.
Uema, Kenyu, 4,413,186., Cl. 250-491.100.

Fujiwara, Michiaki: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,412,413., Cl. 57-304.000.

Fukada, Yasuo: *See*—
Ohtawa, Kimiaki; Takahashi, Hiroyoshi; and Fukada, Yasuo, 4,412,674., Cl. 266-91.000.

Fukami, Akira; Noguchi, Hiroki; and Okamoto, Kunio, to Nippon Soken, Inc. Air conditioning and ventilation system. 4,412,425., Cl. 62-244.000.

Fukuda, Hideo: *See*—
Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047., Cl. 430-94.000.

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Fukuda, Tatsuo: *See*—
Umino, Naotake; and Fukuda, Tatsuo, 4,412,852., Cl. 62-35.000.

Fukuhara, Toru: *See—*
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Fukushima, Tsutomu: *See—*
Miyashita, Tsuneo; Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,412,862., Cl. 75-130.500.
Fundell, Bo W., to Skutskars Rostfria AB. Apparatus for processing tubes. 4,412,401., Cl. 51-103.00R.
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Clement, Heinz; and Furrer, Christina, 4,412,367., Cl. 19-0.250.
Furuhashi, Masami: *See—*
Morita, Shigeru; and Furuhashi, Masami, 4,412,506., Cl. 118-683.000.
Furukawa, Yoshimi; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Steering system for motor vehicles. 4,412,594., Cl. 180-140.000.
Furuta, Kenji, to Olympus Optical Company Limited. Tape recorder with a voice signal responsive circuit. 4,413,290., Cl. 360-69.000.
Fushida, Akira: *See—*
Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047., Cl. 430-94.000.
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Fushino, Tetsuo: *See—*
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039., Cl. 428-643.000.
G. A. Serlachius Oy: *See—*
Larikka, Leo, 4,412,441., Cl. 72-71.000.
G. Siempelkamp GmbH & Co.: *See—*
Pesch, Jurgen, 4,412,801., Cl. 425-338.000.
GA Technologies Inc.: *See—*
Kapich, Davorin D., 4,413,348., Cl. 376-367.000.
Gaertner, Van R., to Monsanto Company. α-Hydroxy phosphonates. 4,413,125., Cl. 546-22.000.
Gagnebin, Gustave, to Hermes Precisa International S.A. Coupling mechanism. 4,412,704., Cl. 308-6.00R.
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Kanno, Takeshi; Gaino, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keiichi, 4,413,006., Cl. 424-250.000.
Gaiser, Robert F.: *See—*
Bach, Lloyd G.; and Gaiser, Robert F., 4,412,702., Cl. 303-6.00C.
Gaiser, William R.; and Niepoky, James, to Broadway Companies, Inc., The. Parison ejector for an injection molding apparatus. 4,412,806., Cl. 425-554.000.
Gallagher, Paul H. Continuous laundering apparatus. 4,412,435., Cl. 68-22.00R.
Gallant, Ben J., to Cavitron Inc. Equipment and method for delivering an abrasive-laden gas stream. 4,412,402., Cl. 51-439.000.
Galow, Manfred; and Stefancik, Nikolaus, to Bergwerksverband GmbH; and Didier Engineering GmbH. Charging of coke ovens and method. 4,412,770., Cl. 414-162.000.
Gans, Michael J.: *See—*
Amitay, Noach; and Gans, Michael J., 4,413,263., Cl. 343-756.000.
Gansert, Willi; Munz, Ulrich; and Kuhn, Edgar, to Robert Bosch GmbH. Self-contained, particularly vehicular network with malfunction indication. 4,413,222., Cl. 320-48.000.
Garrecht, Ewald: *See—*
Fuchs, Gottfried; Garrecht, Ewald; Rieck, Lothar; Ruppel, Wolfgang; Schwarz, Rudolf; and Siegle, Erich, 4,412,641., Cl. 228-37.000.
Garwood, William E.; and Lee, Wooyoung, to Mobil Oil Corporation. Integrated process for making transportation fuels and lubes from wet natural gas. 4,413,153., Cl. 585-304.000.
Gasc, Jean-Claude; Geoffre, Serge; Hospital, Michel; and Laurent, Jacques, to Roussel Uclaf. Hexapeptides. 4,412,988., Cl. 424-177.000.
Gates, Jackson. Apparatus and method for stereo relief modeling. 4,412,799., Cl. 425-150.000.
Gautschi Electro-Fours AG: *See—*
Schlumberger, Jules; and Aebli, Heinrich, 4,412,816., Cl. 432-239.000.
Gavin, Francis M.; and Kruglewicz, Anne M., to Du Pont de Nemours, E. I., and Company. Use of iron oxide pigments in a polymethyl methacrylate article. 4,413,089., Cl. 524-785.000.
Geiselman, Theodore S.: *See—*
Kockler, Barry C.; Geiselman, Theodore S.; and Black, Gerda N., 4,413,265., Cl. 346-1.100.
Gelling, Paul J.; Hunt, James E. B.; and Marshman, John D., to Formica Limited. Continuous production of phenol-formaldehyde resin and laminates produced therefrom. 4,413,113., Cl. 528-165.000.
General DataComm Industries, Inc.: *See—*
Bond, William C.; and Profet, Gary A., 4,413,350., Cl. 377-47.000.
General Dynamics Corporation/Convair Div.: *See—*
Bailey, Richard E., 4,413,349., Cl. 377-24.000.
General Electric Company: *See—*
Brown, Dale M.; and Vosburgh, Kirby G., 4,412,868., Cl. 148-1.500.
Collins, David J.; and Van Doren, James E., 4,412,780., Cl. 415-17.000.
Frye, Robert B., 4,413,088., Cl. 524-714.000.
Grove, Lawrence L.; and Benner, Donald G., 4,413,173., Cl. 219-412.000.
Huseby, Irvin C.; Szymaszek, Jan W.; and Heft, Eldon B., 4,413,062., Cl. 501-123.000.
Rossi, Anthony J., 4,412,422., Cl. 60-706.000.
General Mills, Inc.: *See—*
Loader, Mary A., 4,413,017., Cl. 426-616.000.
General Motors Corporation: *See—*
Arlauskas, Alfonsas, 4,412,695., Cl. 292-173.000.
Beethem, William J.; and Rumsey, Lynn D., 4,412,484., Cl. 100-7.000.
Colvin, Jack A.; and McClellan, John M., 4,412,457., Cl. 74-7.00A.
Derringer, John G., 4,412,458., Cl. 74-512.000.
Hoch, Martin M.; and Stoltman, Donald, 4,412,519., Cl. 123-449.000.
Murphy, James E.; and Reid, Kenneth H., 4,412,691., Cl. 280-803.000.
Novick, Allen S.; Tomlinson, Jerry G.; and Troth, Dennis L., 4,412,414., Cl. 60-39.230.
Turner, Hilton A., Jr., 4,413,228., Cl. 324-51.000.
Van House, Robert M., 4,412,416., Cl. 60-397.000.
Gentex Corporation: *See—*
Lavender, Michael R., 4,412,358., Cl. 2-412.000.
Geoffre, Serge: *See—*
Gasc, Jean-Claude; Geoffre, Serge; Hospital, Michel; and Laurent, Jacques, 4,412,988., Cl. 424-177.000.
Gerber, Bernard R.: *See—*
Berger, Richard F.; Pardes, Greg; and Gerber, Bernard R., 4,412,632., Cl. 222-148.000.
Gerhard, Helmut, to Gerhard KG. Freight container with means for locking the tensioning rings. 4,412,626., Cl. 220-1.500.
Gerhard KG: *See—*
Gerhard, Helmut, 4,412,626., Cl. 220-1.500.
Gerkin, William C.: *See—*
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,412,427., Cl. 62-298.000.
Gerlach, Robert L.; Seibel, David D.; and Miller, Mark C., to Perkin-Elmer Corporation, The. Sample transport system. 4,412,771., Cl. 414-217.000.
German, Mark J.: *See—*
Schultz, Ronald E.; Veres, Jonathan S.; and German, Mark J., 4,413,319., Cl. 364-200.000.
Gerry, Martin E. Electromagnetic field compensated cable. 4,413,304., Cl. 361-253.000.
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt GmbH: *See—*
Maixner, Uwe; and Milferstaedt, Dieter, 4,413,302., Cl. 361-212.000.
Gessler, Donald A., to Dravo Corporation. Adjustable wheel assembly in a rotary solvent extractor. 4,412,976., Cl. 422-270.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Heitkamp, Herbert; and Hohn, Walter, 4,412,758., Cl. 405-145.000.
Giamei, Anthony F.: *See—*
Salkeld, Richard W.; Anderson, Neal P.; and Giamei, Anthony F., 4,412,577., Cl. 164-122.200.
Giannella, Frank; and Pellicciari, Enzo E., to Coldelite Corporation of America. Apparatus for producing and dispensing an aerated frozen confection. 4,412,428., Cl. 62-308.000.
Gibas, Christoph: *See—*
Bartholomaus, Reiner; Gibas, Christoph; Wolfgea, Hans; Hess, Ferdinand; and Schiene, Karl, 4,413,245., Cl. 336-84.00M.
Gibbs, Paul D.: *See—*
Foster, George B.; Gibbs, Paul D.; and Smyser, Michael A., 4,413,322., Cl. 364-448.000.
Gibson, David V.; Parr, Rodney W.; and Swalwell, John E., to ICI Australia Limited. Stable aqueous film-forming dispersions. 4,413,073., Cl. 523-511.000.
Gieldanowski, Siegfried: *See—*
Tesch, Gunter; and Gieldanowski, Siegfried, 4,413,030., Cl. 428-85.000.
Giertz, Hans-Josef, to Bergwerksverband GmbH. Liquid seal for closing an opening of a reaction vessel. 4,412,684., Cl. 277-135.000.
Gilmour, George A., to United States of America, Navy. Scanning beamformer for a very high resolution circular arc sonar. 4,413,332., Cl. 367-123.000.
Giordani, Pietro. Wheeled support structure for a seat or a carry-out of a baby's push chair or perambulator. 4,412,688., Cl. 280-642.000.
Glacier Metal Company Limited, The: *See—*
Davies, Glyndwr J., 4,413,083., Cl. 524-299.000.
Gladfelter, Elizabeth J.; and Rogier, Edgar R., to Henkel Corporation. Glycidyl ethers of aminopolyols. 4,413,138., Cl. 549-551.000.
Glaeser, Arthur F.: *See—*
Greenberg, Melvin B., 4,413,261., Cl. 340-825.720.
Glaxo Group Limited: *See—*
Clitherow, John W., 4,413,135., Cl. 549-495.000.
Gleason, Edward H.: *See—*
Sinclair, Alvin R.; and Gleason, Edward H., 4,413,068., Cl. 523-201.000.
Gleichenhagen, Peter; and Wesselkamp, Ingrid, to Beiersdorf Aktiengesellschaft. Water-soluble, pressure sensitive, self-adhesive compositions and articles made therewith. 4,413,082., Cl. 524-243.000.
Godwin, Paul K., Jr.; and Honda, Ronald T., to Ford Motor Company; and Ford Aerospace & Communications Corp. Optical scanning apparatus incorporating counter-rotation of primary and secondary scanning elements about a common axis by a common driving source. 4,413,177., Cl. 250-203.00R.
Goe, Gerald L.: *See—*
Sowers, Edward E.; Goe, Gerald L.; and Prunier, Michael L., 4,413,099., Cl. 525-327.100.
Goksel, Mehmet A. Pelletizing lignite. 4,412,840., Cl. 44-10.00D.
Golden, Michael D., to Western Design Corporation. Transport mechanism. 4,412,611., Cl. 198-450.000.

Goldman, Alice; and Le Fur, Daniel, to Electricite De France. Method for processing a strip of polymer material by electrical discharge. 4,412,960., Cl. 264-22.000.

Goldner, Sandor: *See*—
Green, Dan; and Goldner, Sandor, 4,413,217., Cl. 318-729.000.

Gostowski, Walter S., Jr.; and Mayrand, James F., to Sprague Electric Company. Integrated circuit including test portion and method for making. 4,413,271., Cl. 357-40.000.

Goodyear Aerospace Corporation: *See*—
Bischoff, Andrea L., 4,412,603., Cl. 188-106.00P.

Goodyear Tire & Rubber Company, The: *See*—
Thompson, Donald R.; and Vogliano, Robert H., 4,412,965., Cl. 264-257.000.

Gorl, Reinhard, to Pfister GmbH. Method for contact-free determination of quality features of a test subject of the meat goods class. 4,413,279., Cl. 358-107.000.

Goscenski, Edward J., Jr., to Eaton Corporation. Controlled differential. 4,412,459., Cl. 74-711.000.

Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG: *See*—
Heubach, Rainer; Marx, Reinhard; and Hauke, Dieter, 4,412,658., Cl. 241-26.000.

Gosudarstvenny Nauchnoissledovatelsky, Proektny I Konstruktorsky Institut Splavov I Obrabotki Tsvetnykh Metallov "Giprotsvetmetobrabotka": *See*—
Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438., Cl. 72-10.000.

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Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857., Cl. 75-11.000.

Goto, Atsushi: *See*—
Kato, Hiroaki; Hamana, Junji; Saksi, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295., Cl. 360-110.000.

Goto, Kunio, to Victor Company of Japan, Limited. Pickup arm with servo-controlled stylus. 4,413,334., Cl. 369-126.000.

Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Carbamate derivatives and insecticidal, miticidal or nematocidal compositions containing the same. 4,413,005., Cl. 424-285.000.

Gotz, Gertrud: *See*—
Coplan, Myron J.; and Gotz, Gertrud, 4,413,106., Cl. 525-534.000.

Gramm, Jeffrey S., to Du Pont de Nemours, E. I., and Company. Process for preparing dialkyl propanediimidate dihydrohalides. 4,412,957., Cl. 260-453.700.

Grant, William O. Method and apparatus for remote indication of faults in coaxial cable R-F transmission systems. 4,413,229., Cl. 324-52.000.

Grant, William P. Centrifugal spin air dryer. 4,412,390., Cl. 34-58.000.

Gras, Rainer: *See*—
Disteldorf, Josef; Gras, Rainer; and Schnurbusch, Horst, 4,413,079., Cl. 524-169.000.

Grasselli, Robert K.: *See*—
Suresh, Dev D.; Grasselli, Robert K.; and Orndoff, David A., 4,413,155., Cl. 585-417.000.

Green, Dan; and Goldner, Sandor, to Cynex Manufacturing Corporation. Power factor controller. 4,413,217., Cl. 318-729.000.

Green, Geoffrey W.; and Lettington, Alan H., to National Research Development Corporation. Coating infra red transparent semiconductor material. 4,412,903., Cl. 204-192.00C.

Green, George E.; Losert, Ewald; and Paul, John G., to Ciba-Geigy Corporation. Photopolymerization process employing compounds containing acryloyl group and anthryl group. 4,413,052., Cl. 430-327.000.

Greenberg, Melvin B., to Glaeser, Arthur F. Coded control for vehicle engine ignition circuit. 4,413,261., Cl. 340-825.720.

Greene, Thomas K. Garment hanging apparatus for passenger automobiles. 4,412,636., Cl. 224-313.000.

Greier, Josef: *See*—
Obermayer, Bertram; Greier, Josef; and Mandl, Walter, 4,412,513., Cl. 123-55.0VE.

Grenda, Victor J.: *See*—
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Grieder, Conrad C.: *See*—
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Griffin & Company, Inc.: *See*—
Wilding, Edwin; and DeVere, James W., 4,412,773., Cl. 414-403.000.

Grob, Burkhart. Method of manufacture of a support wing and flap. 4,412,666., Cl. 244-123.000.

Grodinsky, Grigory I.: *See*—
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857., Cl. 75-11.000.

Gronau, Jurgen, to Kottgen GmbH & Co. Kommanditgesellschaft. Automatic guiding device for an indoor goods transporter. 4,413,210., Cl. 318-16.000.

Grosshauser, Heinrich K., to Koenig & Bauer AG. Paper web guiding mechanism. 4,412,490., Cl. 101-219.000.

Grove, Lawrence L.; and Benner, Donald G., to General Electric Company. Electric toaster control. 4,413,173., Cl. 219-412.000.

Grove Valve and Regulator Company: *See*—
Chow, Peter C. M., 4,412,554., Cl. 137-375.000.

Gruppo Lepetit, S.p.A.: *See*—
Winters, Giorgio, 4,412,953., Cl. 260-239.500.

GSE, Inc.: *See*—
Waineo, Keith R., 4,413,220., Cl. 320-15.000.

GTE Automatic Electric Labs Inc.: *See*—
Clements, John L.; and Magnusson, Stig E., 4,413,335., Cl. 370-16.000.
Reimer, William A.; and Bertellotti, Ansano, 4,412,712., Cl. 339-17.00M.

GTE Laboratories Incorporated: *See*—
Byszewski, Wojciech W.; Budinger, A. Bowman; Proud, Joseph M.; and Riseberg, Leslie A., 4,413,204., Cl. 313-491.000.

GTE Products Corporation: *See*—
Avellino, Frank J.; and Hoffman, John E., 4,412,798., Cl. 425-137.000.
Karlotski, Robert J.; Kulik, Joseph S., Jr.; and Muzeroll, Martin E., 4,413,206., Cl. 313-601.000.
Roche, William J., 4,413,209., Cl. 315-101.000.

Guazzo, Lucien, to Societe Anonyme dite: Les Cables de Lyon. Method of joining together optical fibre undersea cables. 4,412,878., Cl. 156-91.000.

Guerrazzi, Vincent; and Vendramini, Valerio, to Seprosy Societe Europeenne pour la Transformation des Produits de Synthese. Vented synthetic-resin jug. 4,412,633., Cl. 222-468.000.

Guerret, Patrick G.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001., Cl. 424-272.000.

Guigan, Jean. Autonomous simultaneous analysis apparatus and a method of using it. 4,412,973., Cl. 422-72.000.

Gulf Research & Development Company: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,413,064., Cl. 518-715.000.

Gulf & Western Industries, Inc.: *See*—
Burgess, Lester E.; Fox, Karl M.; and McGarry, Phillip E., 4,412,843., Cl. 44-51.000.

Guthrie, Roderick I. L.: *See*—
White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815., Cl. 432-206.000.

Guttmann, Andrew T.: *See*—
Dolhyj, Serge R.; Velenyi, Louis J.; and Guttmann, Andrew T., 4,412,847., Cl. 44-77.000.

Gygax, Claude-Andre: *See*—
Jeannet, Pierre; Froidevaux, Raymond; and Gygax, Claude-Andre, 4,412,751., Cl. 368-276.000.

Gyomrey, Karl M., to Coles Cranes Limited. Telescoping strut crane. 4,412,622., Cl. 212-187.000.

Haar, Wilhelm: *See*—
Steinleitner, Gunther; and Haar, Wilhelm, 4,413,043., Cl. 429-104.000.

Haas, Armand, to Societe Chimique des Charbonnages-CdF Chimie. Embossed films obtained from ethylene-propylene copolymers, and a process and apparatus for manufacturing the films. 4,413,109., Cl. 526-348.000.

Haemonetics Corporation: *See*—
Avery, Hollon B.; and Schoendorfer, Donald W., 4,412,831., Cl. 494-46.000.

Hafner, Erich: *See*—
Ney, Robert J.; and Hafner, Erich, 4,412,508., Cl. 118-726.000.

Hafner, Udo, to Robert Bosch GmbH. Electromagnet. 4,413,244., Cl. 335-250.000.

Haga, Mitsunobu; and Omori, Yasuzi, to Daicel Chemical Industries, Ltd. Coating composition for polycarbonate moldings containing partially hydrolyzed alkyltrialkoxysilane and polyvinylbutyral. 4,413,025., Cl. 427-387.000.

Hagen, Gerry A.; and Donnelly, Edward N., to Badische Corporation. Device for introducing a traveling yarn into a yarn treatment chamber. 4,412,371., Cl. 28-272.000.

Hagii, Hidehiko: *See*—
Kato, Mitsukuni; Demachi, Takuya; Hagii, Hidehiko; and Arai, Takeshi, 4,413,148., Cl. 568-578.000.

Hahn, Michael: *See*—
Wackerle, Peter-Martin; and Hahn, Michael, 4,412,784., Cl. 416-230.000.

Haker, Floyd H. Carousel card dispenser. 4,412,631., Cl. 221-66.000.

Halcon SD Group, Inc., The: *See*—
Khoobiar, Sargis, 4,413,147., Cl. 568-476.000.

Hall, Dale R.; and Bush, Charles N., to B. F. Goodrich Company, The. Process for making low density chlorinated polyvinyl chloride foam. 4,413,065., Cl. 521-82.000.

Hall, Eric R. D., to Schaefer Marine, Inc. Rigging connection assembly. 4,412,499., Cl. 114-108.000.

Hall, John B.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Intermediates used in the process for preparing 1(4-pentenoyl)-3,3-dimethylcyclohexane. 4,413,139., Cl. 560-126.000.

Halliburton Company: *See*—
Brandell, John T., 4,412,584., Cl. 166-169.000.
Streich, Steven G.; Nickles, R. Benton; and Treece, Harold O., 4,412,559., Cl. 138-89.000.

Hamabe, Takafumi; and Moriwaki, Hiroshi, to Matsushita Electric Works, Ltd. Massaging apparatus. 4,412,534., Cl. 128-52.000.
Hamaker, Raymond W.: *See—*
De Bar, David E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,412,376., Cl. 29-576.00B.
Hamana, Junji: *See—*
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295., Cl. 360-110.000.
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, to Matsushita Electric Industrial Co., Ltd. Apparatus for forming an interpole crossover wire between stator coils. 4,412,564., Cl. 140-92.100.
Hammond, Craig B., to Verbatim Corporation. Apparatus for burnishing. 4,412,400., Cl. 51-58.000.
Handly, Robert J.: *See—*
Wilson, Troy K.; and Handly, Robert J., 4,413,326., Cl. 364-748.000.
Handwerker, Gary R., to Midwest Canvas Corp. Protective cover for pile of particulate material. 4,413,029., Cl. 428-61.000.
Haney, Eugene A.; and Partus, Fred P., to Western Electric Company, Inc. Apparatus for supplying fluid to a rotating tube comprising end cap with purging fluid. 4,412,683., Cl. 277-3.000.
Hans Sasserath & Co. KG: *See—*
Ford, Thomas H.; and Sasserath, Arend, 4,412,648., Cl. 236-42.000.
Hansen, Henning: *See—*
Iversen, Kristian; and Hansen, Henning, 4,412,581., Cl. 165-29.000.
Hanyo, Susumu: *See—*
Kawanami, Shumpei; Watanabe, Yasuo; and Hanyo, Susumu, 4,412,442., Cl. 72-128.000.
Hanyu, Yoshiyuki; and Takekoshi, Yasuaki. Feed-control valve with contractable tube. 4,412,669., Cl. 251-4.000.
Happel, Thomas A.: *See—*
Lepley, Richard H.; and Happel, Thomas A., 4,412,762., Cl. 406-134.000.
Hara, Akio: *See—*
Tsuji, Kazuo; Yazu, Shuji; and Hara, Akio, 4,412,980., Cl. 423-446.000.
Hara, Hiromasa, to Tokyo Rope Manufacturing Co., Ltd. Fiber cordage. 4,412,474., Cl. 87-6.000.
Hara, Toshizo: *See—*
Iida, Katumi; Sutoh, Shinji; and Hara, Toshizo, 4,412,424., Cl. 62-209.000.
Hara, Yoshiaki: *See—*
Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802., Cl. 425-392.000.
Harashima, Kiyoshi: *See—*
Naito, Han-Ichiro; Yamaguchi, Tsuneo; and Harashima, Kiyoshi, 4,412,772., Cl. 414-331.000.
Hardtmann, Goetz E.; Repic, Oljan; and Vogt, Susi, to Sandoz, Inc. Process for 3-hydroxy benzodiazepinones. 4,412,952., Cl. 260-239.30D.
Harmon, Alvin E. Hunting stand. 4,412,398., Cl. 43-1.000.
Hartl, Walter, to U.S. Philips Corporation. Flat rotary-anode X-ray tube. 4,413,356., Cl. 378-132.000.
Hartley, Michael D.: *See—*
Cohen, Sherman E.; Ramazzotti, Dario; and Hartley, Michael D., 4,413,255., Cl. 340-622.000.
Hartmann, Erwin, to Optische Werke G. Rodenstock. Vision testing device. 4,412,729., Cl. 351-239.000.
Hartmann, Ludwig; and Ruzek, Ivo, to Freudenberg, Carl. Non-woven fabric with wick action. 4,413,032., Cl. 428-288.000.
Hartwig, Peter, to Carl Freudenberg, Firma. Method for the manufacture of solid electrolyte layers for galvanic cells. 4,412,901., Cl. 204-192.00C.
Hasegawa, Kunio; and Takizuka, Michinori, to Nippon Oil and Fats Co., Ltd. Nitramine composite propellant composition. 4,412,875., Cl. 149-19.900.
Hashimoto, Yoshiro; and Horino, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Paper sheet bundling apparatus. 4,412,411., Cl. 53-587.000.
Hassner, Martin: *See—*
Adler, Roy L.; Hassner, Martin; and Moussouris, John P., 4,413,251., Cl. 340-347.0DD.
Hata, Setsuo: *See—*
Watanabe, Kenkichi; and Hata, Setsuo, 4,412,550., Cl. 133-8.00A.
Hatfield, W. Robert; Heck, Ronald M.; and Hsiung, Thomas H., to Engelhard Corporation. Method for recovering platinum in a nitric acid plant. 4,412,859., Cl. 75-83.000.
Hathaway, Richard A., to Ampex Corporation. Magnetic tape transport. 4,413,293., Cl. 360-85.000.
Hattori, Masayuki: *See—*
Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187., Cl. 250-491.100.
Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, to Asahi Kasei Kogyo Kabushiki Kaisha. Isoprene-butadiene copolymer rubber having improved processing properties. 4,413,098., Cl. 525-314.000.
Hauke, Dieter: *See—*
Heubach, Rainer; Marx, Reinhard; and Hauke, Dieter, 4,412,658., Cl. 241-26.000.
Hauni-Werke Korber & Co. KG: *See—*
Hausler, Nikolaus; and Helms, Adolf, 4,412,505., Cl. 118-674.000.
Hauske, James R., to Pfizer Inc. Semi-synthetic macrolides. 4,413,119., Cl. 536-7.200.
Hausler, Nikolaus; and Helms, Adolf, to Hauni-Werke Korber & Co. KG. Apparatus for applying atomized liquid to a running layer of filamentary material or the like. 4,412,505., Cl. 118-674.000.
Hawkeye Concrete Products Co.: *See—*
Schmidgall, Ronald D., 4,412,817., Cl. 432-247.000.
Hayakawa, Yoshikazu; and Ogawa, Naoki, to Nissan Motor Co., Ltd. Low noise level internal combustion engine. 4,412,514., Cl. 123-195.00R.
Hayashi, Hideo: *See—*
Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, 4,413,067., Cl. 523-172.000.
Hayashi, Yoshimasa, to Nissan Motor Company, Ltd. Low-noise level internal combustion engine. 4,412,516., Cl. 123-198.00E.
Hearn, Daniel P., to Atlantic Richfield Company. Level detector. 4,413,182., Cl. 250-357.100.
Hechenbleikner, Ingenuin: *See—*
Valdiserri, Leo L.; and Hechenbleikner, Ingenuin, 4,413,077., Cl. 524-120.000.
Heck, Ronald M.: *See—*
Hatfield, W. Robert; Heck, Ronald M.; and Hsiung, Thomas H., 4,412,859., Cl. 75-83.000.
Heft, Eldon B.: *See—*
Huseby, Irvin C.; Szymaszek, Jan W.; and Heft, Eldon B., 4,413,062., Cl. 501-123.000.
Hegedus, Louis, to W. R. Grace & Co. Cross-flow monolith reactor. 4,413,041., Cl. 429-33.000.
Heil, Robert H.: *See—*
Benjamin, Fred; and Heil, Robert H., 4,413,221., Cl. 320-48.000.
Hein, Lehmann AG: *See—*
Schmidt, Heinrich, 4,412,865., Cl. 127-19.000.
Hein, Richard A., to Centronics Data Computer Corp. Ink supply system for ink jet printing apparatus. 4,413,267., Cl. 346-75.000.
Heitkamp, Herbert; and Hohn, Walter, to Gewerkschaft Eisenhutte Westfalia. Hydraulic control means. 4,412,758., Cl. 405-145.000.
Helb, Horst-Dietrich: *See—*
Assmann, Gerd; and Helb, Horst-Dietrich, 4,413,060., Cl. 436-47.000.
Helm Instrument Company, Inc.: *See—*
Wilhelm, Donald F.; and Moser, Robert L., 4,412,456., Cl. 73-862.650.
Helms, Adolf: *See—*
Hausler, Nikolaus; and Helms, Adolf, 4,412,505., Cl. 118-674.000.
Henke, Otto K.: *See—*
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Henkel Corporation: *See—*
Gladfelter, Elizabeth J.; and Rogier, Edgar R., 4,413,138., Cl. 549-551.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Wiegner, Georg; and Reinwald, Elmar, 4,412,833., Cl. 604-14.000.
Hennecke, Rudolf: *See—*
Kummel, Friedrich; Hennecke, Rudolf; and Schubert, Manfred, 4,412,757., Cl. 404-113.000.
Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg. Process for bringing liquids into contact. 4,413,021., Cl. 427-236.000.
Herbes, William F., to American Cyanamid Company. Alkylated methylol melamine resin condensate compositions having low formaldehyde release. 4,413,100., Cl. 525-398.000.
Herborn, Peter E.; Liu, Thomas T.; and Young, Sze-Teh, to NCR Corporation. High speed low temperature diazo processor. 4,412,731., Cl. 354-299.000.
Herder, Kornelis: *See—*
Muis, Roelof; and Herder, Kornelis, 4,412,487., Cl. 101-41.000.
Hergeth, Incorporated: *See—*
Smith, George F., Jr., 4,412,410., Cl. 53-528.000.
Hermes Precisa International S.A.: *See—*
Gagnebin, Gustave, 4,412,704., Cl. 308-6.00R.
Herrbach, Francois: *See—*
Bitoune, Sylviane; Dufond, Pierre; Herrbach, Francois; and Lecreff, Maurice, 4,413,241., Cl. 333-22.00R.
Herrington, Kenneth M., to International Business Machines Corporation. Use of nodes to uniquely identify processes. 4,413,318., Cl. 364-200.000.
Herrmann, John L., Jr.: *See—*
Bell, Malcolm R.; and Herrmann, John L., Jr., 4,412,995., Cl. 424-251.000.
Hertz, Carl H.; and Nilsson, Jan O. Optical scanner for color facsimile. 4,413,276., Cl. 358-75.000.
Hess, Bernhard; Schulz-Walz, Hansjochen; von Harpe, Hannes; Peltzer, Bernd; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Mixtures of polyurethanes and unsaturated polyester resins. 4,413,072., Cl. 523-500.000.
Hess, Ferdinand: *See—*
Bartholomaus, Reiner; Gibas, Christoph; Wolfges, Hans; Hess, Ferdinand; and Schiene, Karl, 4,413,245., Cl. 336-84.00M.
Hessler, Edward J.: *See—*
Walker, Jerry A.; and Hessler, Edward J., 4,412,955., Cl. 260-397.450.
Hettinger, William P., Jr.; Hoffman, James F.; and Kovach, Stephen M., to Ashland Oil, Inc. Endothermic removal of coke deposited on sorbent materials during carbo-metallic oil conversion. 4,412,914., Cl. 208-253.000.
Heubach, Rainer; Marx, Reinhard; and Hauke, Dieter, to Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG. Method and a device for manufacturing partially oxidized lead dust. 4,412,658., Cl. 241-26.000.

Hi-Stat Manufacturing Co., Inc.: *See*—
Hire, Charles J., 4,413,247., Cl. 337-368.000.
Higuchi, Saburo: *See*—
Kawata, Hiroitsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, 4,412,986., Cl. 424-80.000.
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, to Nippon Steel Corporation. Steel sheet plated with layers of NiSn and Pb-Sn alloy for automotive fuel tank. 4,413,039., Cl. 428-643.000.
Hing, Peter. Method of producing discharge lamp arc tubes. 4,412,963., Cl. 264-61.000.
Hinsenkamp, James A., to National Distillers and Chemical Corporation. Transition metal carbonyl complexes intercalated with lamellar materials and use of the intercalated complexes in the catalysis of organic reactions. 4,413,146., Cl. 568-451.000.
Hirai, Minoru: *See*—
Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, 4,412,937., Cl. 502-423.000.
Hiraide, Shigeru: *See*—
Okino, Haruka; Ogawa, Keitkitsu; Takeda, Sunao; Mohri, Hiromichi; and Hiraide, Shigeru, 4,412,545., Cl. 128-691.000.
Hirane, Hideo: *See*—
Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285., Cl. 358-260.000.
Hirata, Tadashi; and Sakamoto, Katsuyoshi, to Amada Company, Ltd. Turret punch presses having tool holders rotatably mounted in the turrets. 4,412,469., Cl. 83-552.000.
Hire, Charles J., to Hi-Stat Manufacturing Co., Inc. Thermally responsive electrical switch means and method of manufacture. 4,413,247., Cl. 337-368.000.
Hiross, Inc.: *See*—
Mecozzi, Walter P.; Mager, Gary C.; and Maliszewski, Stephen A., 4,412,582., Cl. 165-76.000.
Hirota, Hajime; and Watanabe, Hiroshi, to Kao Soap Co., Ltd. Liquid detergent composition. 4,412,943., Cl. 252-546.000.
Hirota, Kunio: *See*—
Sugiyama, Akira; and Hirota, Kunio, 4,412,640., Cl. 227-85.000.
Hitachi Ltd.: *See*—
Abe, Masahiro; and Fujio, Masayuki, 4,412,781., Cl. 415-53.00R.
Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285., Cl. 358-260.000.
Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,413,283., Cl. 358-213.000.
Fujie, Kunio; Uchida, Akinari; and Abe, Kazuhiko, 4,412,527., Cl. 126-400.000.
Izumita, Morishi; Akiyama, Toshiyuki; Sato, Kazuhiro; and Nagahara, Shusaku, 4,413,284., Cl. 358-213.000.
Koike, Keiichi; and Yanadori, Michio, 4,412,930., Cl. 252-70.000.
Matsumoto, Toshio, 4,413,355., Cl. 378-127.000.
Tanaka, Yasuo; Sasano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, 4,412,900., Cl. 204-192.00P.
Hitachi Plant Engineering and Construction Co., Ltd.: *See*—
Koike, Keiichi; and Yanadori, Michio, 4,412,930., Cl. 252-70.000.
Hitchcock, James: *See*—
Kopp, Clinton V.; and Hitchcock, James, 4,412,553., Cl. 137-118.000.
Hoch, Louis, to Becton Dickinson and Company. Multiple sample needle assembly. 4,412,548., Cl. 128-764.000.
Hoch, Martin M.; and Stoltman, Donald, to General Motors Corporation. Diesel fuel distributor type injection pump. 4,412,519., Cl. 123-449.000.
Hoechst Aktiengesellschaft: *See*—
Brandt, Lothar; Holst, Arno; and Kleiner, Hans-Jerg, 4,413,121., Cl. 536-44.000.
Fischer, Hartmut; and Skaletz, Detlef H., 4,413,149., Cl. 568-636.000.
Hoegerle, Karl; and Ohnemus, Kurt, to Ciba-Geigy Corporation. 2-Alkyl-5-alkylsulfonyl-4,6-dihalopyrimidines and the production thereof. 4,413,124., Cl. 544-319.000.
Hoegh, Poul E., to Country Baked Hams, Inc. Spiral meat slicer. 4,412,483., Cl. 99-538.000.
Hofer, Alan; and Yama, Frank M. Miniature sounder with double tuned cavity. 4,413,253., Cl. 340-388.000.
Hoffman, James F.: *See*—
Hettinger, William P., Jr.; Hoffman, James F.; and Kovach, Stephen M., 4,412,914., Cl. 208-253.000.
Hoffman, John E.: *See*—
Avellino, Frank J.; and Hoffman, John E., 4,412,798., Cl. 425-137.000.
Hoffmann-La Roche Inc.: *See*—
Zurfluh, Rene, 4,413,010., Cl. 424-300.000.
Hohn, Walter: *See*—
Heitkamp, Herbert; and Hohn, Walter, 4,412,758., Cl. 405-145.000.
Hollenbach, David A. Two-piece mechanical flag. 4,412,646., Cl. 232-34.000.
Holmes, Ann: *See*—
Sircar, Ila; and Holmes, Ann, 4,413,011., Cl. 424-309.000.
Holst, Arno: *See*—
Brandt, Lothar; Holst, Arno; and Kleiner, Hans-Jerg, 4,413,121., Cl. 536-44.000.
Holstedt, Richard A.; and Jessup, Peter, to Union Oil Company of California. Corrosion inhibitors for boron-containing lubricants. 4,412,928., Cl. 252-46.400.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Aiba, Yasuaki, 4,412,597., Cl. 180-228.000.
Furukawa, Yoshimi; and Sano, Shoichi, 4,412,594., Cl. 180-140.000.
Honda, Kiyokazu: *See*—
Baba, Masaharu; and Honda, Kiyokazu, 4,412,716., Cl. 339-176.00L.
Honda, Makoto: *See*—
Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, 4,413,098., Cl. 525-314.000.
Honda, Ronald T.: *See*—
Godwin, Paul K., Jr.; and Honda, Ronald T., 4,413,177., Cl. 250-203.00R.
Hone, John W.; and Cadle, Terence M., to Brico Engineering Limited. Sintered metal articles and their manufacture. 4,412,873., Cl. 148-16.500.
Honeywell Inc.: *See*—
Wilson, Troy K.; and Handly, Robert J., 4,413,326., Cl. 364-748.000.
Honeywell Information Systems Inc.: *See*—
Schieve, Edmund H., 4,412,609., Cl. 198-341.000.
Hopper, Willard C., Jr. Bicycle sealed bearing and method. 4,412,706., Cl. 308-192.000.
Horgan, Paul M.: *See*—
Yates, Wesley E.; Cowden, Robert E.; Akesson, Norman B.; and Horgan, Paul M., 4,412,654., Cl. 239-171.000.
Horimoto, Mitsuaki, to Minolta Camera Kabushiki Kaisha. Fish eye lens system. 4,412,726., Cl. 350-461.000.
Horino, Shigeo: *See*—
Hashimoto, Yoshiro; and Horino, Shigeo, 4,412,411., Cl. 53-587.000.
Horiuchi, Hideo; and Yoshida, Kazutaka, to Fuji Photo Film Co., Ltd. Ink-jet color printing apparatus. 4,413,275., Cl. 358-75.000.
Horn, Franziskus; and Fluck, Ekkehard, to Degesch. Process for preparing aluminum or magnesium phosphide. 4,412,979., Cl. 423-299.000.
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., to United States of America, Army. Noncontact thermal interface. 4,412,427., Cl. 62-298.000.
Hornby, Thomas W., to Northrop Corporation. Aircraft rocket and missile launcher. 4,412,475., Cl. 89-1.816.
Horvath, Stanley K., to Ford Motor Company. Paint composition comprising hydroxy functional film former and improved stabilized flow control additive. 4,413,084., Cl. 524-315.000.
Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Color synchronizing circuit. 4,413,274., Cl. 358-25.000.
Hospital, Michel: *See*—
Gasc, Jean-Claude; Geoffre, Serge; Hospital, Michel; and Laurent, Jacques, 4,412,988., Cl. 424-177.000.
Houghton, Russell J., to International Business Machines Corporation. Array word line driver system. 4,413,191., Cl. 307-254.000.
Houghton, Timothy J.; Szwargulski, Carl J., Jr.; Bentrup, Jerry A.; and Smidt, Donald L., to Metal Container Corporation. Drawn and ironed can body. 4,412,627., Cl. 220-66.000.
Howson, Barry R. Method of cleaning fibreglass. 4,412,932., Cl. 252-136.000.
Hsieh, Shing-Chang R.: *See*—
Torpie, John D.; Lozen, Robert F.; and Hsieh, Shing-Chang R., 4,413,287., Cl. 358-288.000.
Hsiung, Thomas H.: *See*—
Hatfield, W. Robert; Heck, Ronald M.; and Hsiung, Thomas H., 4,412,859., Cl. 75-83.000.
Huffnagle, Clifton W.; Morningstar, LeRoy J.; and Tighe, Charles L., Jr., to AMP Incorporated. Apparatus for transposing a pair of parallel and adjacent conductors into a vertical relationship. 4,412,566., Cl. 140-147.000.
Hughes, Richard E., to Henke, Otto K. Fill valve. 4,412,568., Cl. 141-392.000.
Huizinga, Donald D.; Means, Donald R.; and Underhill, Edward W., to Bell Telephone Laboratories, Incorporated. Dial pulsing circuit. 4,413,159., Cl. 179-90.00K.
Hummel, Klaus: *See*—
Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, 4,412,998., Cl. 424-267.000.
Hunt, James E. B.: *See*—
Gelling, Paul J.; Hunt, James E. B.; and Marshman, John D., 4,413,113., Cl. 528-165.000.
Hurst, Robert N., to RCA Corporation. Indicator control signal generator for video tape recorder. 4,413,288., Cl. 360-31.000.
Huseby, Irvin C.; Szymaszek, Jan W.; and Heft, Eldon B., to General Electric Company. Molding composition and product produced therefrom. 4,413,062., Cl. 501-123.000.
Huskins, Chester W.; and Williams, Leroy J., to United States of America, Army. Silane ballistic modifier containing propellant. 4,412,874., Cl. 149-19.200.
Huther, Werner, to MTU Motoren-Und Turbinen Union Munchen GmbH. Apparatus for injection molding of precision parts. 4,412,804., Cl. 425-546.000.
Hylsa, S.A.: *See*—
Viramontes-Brown, Ricardo; and Castanon, Jorge B., 4,412,858., Cl. 75-38.000.
Ibaragi, Toshio: *See*—
Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, 4,413,098., Cl. 525-314.000.
ICI Australia Limited: *See*—
Gibson, David V.; Parr, Rodney W.; and Swalwell, John E., 4,413,073., Cl. 523-511.000.

Idemitsu Kosan Co., Ltd.: *See*—
Kurashige, Tomozo; and Shimada, Hidetoshi, 4,412,864., Cl. 106-235.000.
Iguchi, Masaaki: *See*—
Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiro, 4,412,886., Cl. 156-645.000.
Iida, Katumi; Sutoh, Shinji; and Hara, Toshizo, to Diesel Kiki Company, Ltd. Air conditioning system for preventing fogging of vehicle windows. 4,412,424., Cl. 62-209.000.
Iida, Sadahiko: *See*—
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005., Cl. 424-285.000.
Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, to Toho Belson Co., Ltd. Method for manufacture of activated carbon fiber. 4,412,937., Cl. 502-423.000.
Ikematu, Takeshi: *See*—
Hattori, Yasuo; Ikematu, Takeshi; Ibaragi, Toshio; and Honda, Makoto, 4,413,098., Cl. 525-314.000.
Iker, Jean: *See*—
Probst, Nicolas J.; Iker, Jean; and Autin, Jacques, 4,412,941., Cl. 252-511.000.
IMI Kynoch Limited: *See*—
Knights, Richard N.; and Whittall, Peter H. (said Peter H. Whittall assors. to), 4,412,492., Cl. 102-204.000.
Inagaki, Yoshio; Okazaki, Masaki; and Fujita, Shinsaku, to Fuji Photo Film Co., Ltd. Reagents for measuring lipase activity. 4,412,951., Cl. 260-202.000.
Inai, Toshimi: *See*—
Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,412,882., Cl. 156-188.000.
Ingersoll-Rand Company: *See*—
Bowman, James L., 4,412,796., Cl. 418-201.000.
Ingwall, Joanne S.: *See*—
Fossel, Eric T.; and Ingwall, Joanne S., 4,413,233., Cl. 324-300.000.
Inland Steel Company: *See*—
Du Broff, William; Craig, George H.; and Veslocki, Timothy A., 4,412,841., Cl. 44-10.00C.
Innovative Research Corporation: *See*—
Smith, Jerry R., 4,412,437., Cl. 70-338.000.
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Instant Replay Systems: *See*—
Murray, John M., 4,413,277., Cl. 358-93.000.
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Audibert, Francois; Sugier, Andre; and Van Landeghem, Hugo, 4,413,063., Cl. 518-700.000.
Ballerini, Daniel; Chaude, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastele, Jean-Paul, 4,412,925., Cl. 252-8.55D.
Damin, Bernard; Forestiere, Alain; and Sillion, Bernard, 4,413,133., Cl. 549-265.000.
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Kolbanovsky, July A.; Tsagareli, Romeo V.; and Schipachev, Viktor S., 4,412,552., Cl. 137-14.000.
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Ahjopalo, Hannu T., 4,412,917., Cl. 210-104.000.
Intel Corporation: *See*—
Matthews, James A., 4,412,375., Cl. 29-571.000.
Interlake, Inc.: *See*—
Ducharme, Ronald L.; and Taylor, Robin, 4,413,219., Cl. 320-15.000.
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Adler, Roy L.; Hassner, Martin; and Moussouris, John P., 4,413,251., Cl. 340-347.0DD.
Aviram, Ari; Kovac, Zalata; and Myers, Robert A., 4,413,266., Cl. 346-21.000.
Chao, Hu H.; and Dennard, Robert H., 4,413,330., Cl. 365-205.000.
De Bar, David E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,412,376., Cl. 29-576.00B.
Herrington, Kenneth M., 4,413,318., Cl. 364-200.000.
Houghton, Russell J., 4,413,191., Cl. 307-254.000.
Kumar, Ananda H.; McMillan, Peter W.; and Tummala, Rao R., 4,413,061., Cl. 501-7.000.
Pawletko, Joseph P.; and Pigos, Charles R., 4,413,269., Cl. 346-154.000.
Thoma, Endre P., 4,413,329., Cl. 365-189.000.
Videki, Edwin R., II, 4,413,328., Cl. 364-900.000.
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Johnson, Kenneth C., 4,413,227., Cl. 323-315.000.
International Flavors & Fragrances Inc.: *See*—
Hall, John B.; and Sprecker, Mark A., 4,413,139., Cl. 560-126.000.
International Harvester Co.: *See*—
Cellitti, Raymond A.; and Connelly, John J., 4,412,752., Cl. 374-43.000.
Sorensen, Robert; Barrett, Edward A.; and Scarnato, Thomas J., 4,412,761., Cl. 406-98.000.
INTERx Research Corporation: *See*—
Sloan, Kenneth B.; and Little, Roy, 4,412,994., Cl. 424-248.530.
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Lietti, Andrea; and Bonati, Attilio, 4,413,004., Cl. 424-283.000.
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Isaka, Tsutomu; Ishioka, Mitsugu; Shimada, Takeo; and Inoue, Takayuki, to Mitsubishi Petrochemical Company, Ltd. Crosslinkable polyethylene resin compositions. 4,413,066., Cl. 521-149.000.
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Yamashita, Ichiro; and Ise, Yukihiko, 4,412,454., Cl. 73-728.000.
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Kanno, Takeshi; Gaino, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keiichi, 4,413,006., Cl. 424-250.000.
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Miyata, Hideo; and Ishii, Hitoshi, 4,413,024., Cl. 427-370.000.
Ishii, Katsumi; and Chikaraishi, Takayo, to Nissan Motor Company, Limited. Door handle device for an automotive vehicle. 4,412,696., Cl. 292-336.300.
Ishii, Koji, to Ryobi Ltd. Automatic printing machine. 4,412,488., Cl. 101-142.000.
Ishii, Shiro, to M-S Corporation. Divided cash drawer with slots and two trays. 4,412,709., Cl. 312-291.000.
Ishii, Yutaka: *See*—
Yasuda, Shuhei; Koyanagi, Katsubumi; Ishii, Yutaka; and Wada, Tomio, 4,413,256., Cl. 340-784.000.
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, to Canon Kabushiki Kaisha. Multilayer electrophotographic photosensitive member comprises diazo charge generator layer, hydrazone transport layer. 4,413,045., Cl. 430-59.000.
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Takahashi, Masatoshi; Sugiyama, Mituo; Toisawa, Osamu; and Ishizaki, Yasuo, 4,412,945., Cl. 252-551.000.
Isomura, Masayoshi: *See*—
Okamoto, Kiyokazu; and Isomura, Masayoshi, 4,413,212., Cl. 318-317.000.
Ito, Akio; Nakamura, Kyuzo; Ota, Yoshifumi; and Yamada, Taiki, to Nihon Shinku Gijutsu Kabushiki Kaisha. Ferromagnetic high speed sputtering apparatus. 4,412,907., Cl. 204-298.000.
Ito, Kunihiro: *See*—
Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiro, 4,412,886., Cl. 156-645.000.
Ito, Takuzo; Suzuki, Tadashi; and Miyake, Tatsuro, to Mitsubishi Denki Kabushiki Kaisha. Hydraulic elevator. 4,412,600., Cl. 187-17.000.
Itoh, Takeo: *See*—
Kurachi, Hisao; Itoh, Takeo; and Onoda, Hiroshi, 4,412,755., Cl. 400-697.100.
Itou, Mitiharu: *See*—
Fukuda, Hirokazu; Shinohara, Koji; and Itou, Mitiharu, 4,413,343., Cl. 372-44.000.
Ivanov, Konstantin; and Cascio, Jack, to Ethicon, Inc. Three panel needled suture holder. 4,412,614., Cl. 206-63.300.
Iversen, Kristian; and Hansen, Henning, to Danfoss A/S. Heating installation comprising a boiler and a heat pump. 4,412,581., Cl. 165-29.000.
Iwamoto, Ikuo: *See*—
Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuo; Doi, Toshitada; and Vries, Lodewijk B., 4,413,340., Cl. 371-39.000.
Iwanade, Hisao; and Negoro, Ikuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Position detecting device for a zoom lens of a copying machine. 4,412,737., Cl. 355-55.000.
Iwasaki, Hidenori; Urata, Yukio; and Kasukawa, Shunichi, to Tokyo Ohka Kogyo Kabushiki Kaisha. Photosensitive polymer and photosensitive material for photomechanical process. 4,413,091., Cl. 525-61.000.
Iwasaki, Keiji: *See*—
Iwashita, Yuji; Ajisaka, Katsumi; and Iwasaki, Keiji, 4,412,989., Cl. 424-177.000.
Iwase, Nobuo: *See*—
Nagashima, Kenji; Matsumoto, Hiroshi; Tanaka, Masataka; Oodaira, Hirosi; and Iwase, Nobuo, 4,412,377., Cl. 29-577.00C.
Iwashita, Yuji; Ajisaka, Katsumi; and Iwasaki, Keiji, to Ajinomoto Company Incorporated. Oxygen carrier. 4,412,989., Cl. 424-177.000.
Iwata, Yasuhiro: *See*—
Shibuya, Kunihiro; and Iwata, Yasuhiro, 4,412,734., Cl. 355-3.0SH.
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, to Kawasaki Jukogyo Kabushiki Kaisha. Pulverized coal burner. 4,412,810., Cl. 431-186.000.
Izumi, Kazuo: *See*—
Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, 4,412,937., Cl. 502-423.000.
Izumita, Morishi; Akiyama, Toshiyuki; Sato, Kazuhiro; and Nagahara, Shusaku, to Hitachi, Ltd. Noise reducer for a solid state imager. 4,413,284., Cl. 358-213.000.
Jabs, Gert: *See*—
Wegner, Christian; Jabs, Gert; and Dahm, Manfred, 4,412,959., Cl. 264-4.100.
Jackson, Ronald A., to Black & Decker Inc. Vise for workbench. 4,412,676., Cl. 269-101.000.
Janich, Hans-Jurgen. Device for shutting off large pipes. 4,412,556., Cl. 137-614.110.
Janssen, Alexander P. Disposable cooking bags. 4,412,482., Cl. 99-403.000.
Janssen, Edward W., to Minnesota Mining & Manufacturing Company. Anaerobically-curing compositions. 4,413,108., Cl. 526-301.000.
Japan Crown Cork, Co., Ltd.: *See*—
Murayama, Kashiwa, 4,412,797., Cl. 425-114.000.

Jarvik, Robert K., to United States Surgical Corporation. Repeating hemostatic clip applying instruments and multi-clip cartridges therefor. 4,412,539., Cl. 128-325.000.

Jason, Barry L., to Motorola, Inc. Low temperature coefficient logarithmic electronic gain controlled amplifier. 4,413,235., Cl. 330-254.000.

Jeannet, Pierre; Froidevaux, Raymond; and Gygax, Claude-Andre, to Omega SA. Jointed electronic watch. 4,412,751., Cl. 368-276.000.

Jeff Company, Inc.: *See*—
Wenz, William, 4,412,778., Cl. 414-733.000.

Jeffers, Frederick J., to Eastman Kodak Company. Thin film magnetoresistive head. 4,413,296., Cl. 360-113.000.

Jendrzejek, Gary S.: *See*—
LaBorde, Russell G.; and Jendrzejek, Gary S., 4,412,792., Cl. 417-454.000.

Jeneric Industries, Inc.: *See*—
Prasad, Arun, 4,412,970., Cl. 420-463.000.

Jenkins, Merrill M. E., Sr.: *See*—
Flavan, David B., Jr.; Jenkins, Merrill M. E., Sr.; White, James S.; and Pate, James E., 4,412,610., Cl. 198-403.000.

Jerard, Robert B.: *See*—
Bessette, Michael D.; and Jerard, Robert B., 4,412,962., Cl. 264-46.400.

Jessup, Peter: *See*—
Holstedt, Richard A.; and Jessup, Peter, 4,412,928., Cl. 252-46.400.

Jidosha Kiki Co., Ltd.: *See*—
Obe, Takeshi; and Ohsaki, Hiroshi, 4,412,789., Cl. 417-288.000.

Johns, Robert H. Multiple frequency tuned circuit. 4,413,262., Cl. 343-722.000.

Johnson, Kenneth C., to International Computers Limited. Negative resistance element. 4,413,227., Cl. 323-315.000.

Johnson, Timothy L.: *See*—
Callahan, Alfred S.; Rhodes, James S.; and Johnson, Timothy L., 4,412,547., Cl. 128-731.000.

Johnston, Barry W. Closed loop solar collector system with dual reservoirs and fluid bypass. 4,412,529., Cl. 126-419.000.

Johnston, Brian F.: *See*—
White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815., Cl. 432-206.000.

Jones, Cynthia G.: *See*—
Abbott, Thomas I.; and Jones, Cynthia G., 4,413,053., Cl. 430-502.000.

Jones, Edward M., to Baldwin Piano & Organ Company. System for communicating data among microcomputers in an electronic musical instrument. 4,412,470., Cl. 84-1.010.

Jones, Stephen H., to Nordson Corporation. Method of heat control in a skin packaging machine. 4,413,172., Cl. 219-411.000.

Jones, William A.; and Young, Hugh M. Safety shift device for outboard motors. 4,412,826., Cl. 440-86.000.

Josephs, Richard M.; and Wang, Tsing-Chow, to Sperry Corporation. Three Josephson junction direct coupled isolation circuit. 4,413,196., Cl. 307-462.000.

Josephs, Richard M.; and Wang, Tsing-Chow, to Sperry Corporation. Four Josephson junction direct-coupled and gate circuit. 4,413,197., Cl. 307-462.000.

Juda, Walter; Allen, Robert J.; and Bar-Ilan, Amiram, to Prototech Company. Process for electrowinning of massive zinc with hydrogen anodes. 4,412,894., Cl. 204-119.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brustle, Klaus, 4,412,366., Cl. 16-236.000.

Jung, Michel: *See*—
Bey, Philippe; and Jung, Michel, 4,413,141., Cl. 562-561.000.

Jurkowski, Walter J., to Pitney Bowes Inc. Tubular knife. 4,412,466., Cl. 83-200.000.

Kabanov, Pavel S.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201., Cl. 310-260.000.

Kabushiki Kaisha Kobe Seikio Sho: *See*—
Nagai, Nobuyuki; Takahashi, Eiji; Matsumoto, Yoji; and Ohtsu, Hideaki, 4,412,453., Cl. 73-601.000.

Kabushiki Kaisha Kurio-Medikaru: *See*—
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538., Cl. 128-303.100.

Kabushiki Kaisha Medos Kenkyusho: *See*—
Chikashige, Kiyoshi, 4,412,531., Cl. 128-4.000.

Kabushiki Kaisha Toyoda Jidoshokki: *See*—
Kobayashi, Takeshi; and Suzuki, Hajime, 4,412,562., Cl. 139-54.000.

Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., to Gosudarstvenny Proektny I Nauchno-Issledovatelsky Institut "Gipronikel". Method of smelting ferronickel in ore-smelting electrical furnace under a layer of charge. 4,412,857., Cl. 75-11.000.

Kageyama, Takao; Suzuki, Yoshiaki; and Watanabe, Eiichi, to Nippon Electric Co., Ltd. Multicavity klystron. 4,413,207., Cl. 315-5.520.

Kahara, Lasse S.: *See*—
Uusitalo, Seppo J.; von Alfthan, Georg C.; Andersson, Tor S.; Paukku, Vaino A.; Kahara, Lasse S.; and Kiuru, Erkki S., 4,412,451., Cl. 73-432.0PS.

Kakishima, Todomu: *See*—
Ohtani, Yoshio; Wakiya, Michio; and Kakishima, Todomu, 4,413,249., Cl. 340-52.00R.

Kakizaki, Tetsuji; and Mizutani, Toshikazu, to Mitsubishi Petrochemical Company Limited. Semiconducting resin compositions. 4,412,938., Cl. 252-511.000.

Kamada, Minoru: *See*—
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039., Cl. 428-643.000.

Kamezaki, Yasushi: *See*—
Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047., Cl. 430-94.000.

Kamioka, Hajime: *See*—
Takagi, Mikio; and Kamioka, Hajime, 4,412,388., Cl. 34-1.000.

Kaneko, Takushi: *See*—
Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., 4,413,134., Cl. 549-332.000.

Kanemoto, Tetsuaki: *See*—
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, 4,413,102., Cl. 525-453.000.

Kanno, Takeshi; Gaino, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keiichi, to Tanabe Seiyaku Co., Ltd. N-Aryl-N-phenoxy-alkyl-piperazine compounds useful in decreasing intracranial pressure. 4,413,006., Cl. 424-250.000.

Kao Soap Co., Ltd.: *See*—
Hirota, Hajime; and Watanabe, Hiroshi, 4,412,943., Cl. 252-546.000.

Kapich, Davorin D., to GA Technologies Inc. System for producing process heat. 4,413,348., Cl. 376-367.000.

Karanatsios, Dimitrios, to Sandoz Ltd. 4,5,6,7-Tetrahalo-isoindolin-1-one derivatives. 4,413,131., Cl. 548-461.000.

Karlotski, Robert J.; Kulik, Joseph S., Jr.; and Muzeroll, Martin E., to GTE Products Corporation. Metal halide arc discharge lamp having electrolysis prevention means. 4,413,206., Cl. 313-601.000.

Karp, Joel A.: *See*—
Sabo, Joseph D.; and Karp, Joel A., 4,413,327., Cl. 364-900.000.

Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., to Kaspar Wire Works, Inc. Coin dispensing machine for non-ferrous beverage cans. 4,412,608., Cl. 194-4.00D.

Kaspar, Don G.: *See*—
Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., 4,412,608., Cl. 194-4.00D.

Kaspar, Josephine A.: *See*—
Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., 4,412,608., Cl. 194-4.00D.

Kaspar Wire Works, Inc.: *See*—
Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., 4,412,608., Cl. 194-4.00D.

Kasukawa, Shunichi: *See*—
Iwasaki, Hidenori; Urata, Yukio; and Kasukawa, Shunichi, 4,413,091., Cl. 525-61.000.

Katagiri, Kazuharu: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,413,045., Cl. 430-59.000.

Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, to Canon Kabushiki Kaisha. Magnetic head. 4,413,295., Cl. 360-110.000.

Kato, Mitsukuni; Demachi, Takuya; Hagii, Hidehiko; and Arai, Takeshi, to Nippon Oil and Fats Co., Ltd. Process for producing dicumylperoxide. 4,413,148., Cl. 568-578.000.

Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, to Mita Industrial Co., Ltd. Cadmium photoconductor with (dialkylpyrophosphato) organic titanate additive. 4,413,047., Cl. 430-94.000.

Katoh, Yujiro: *See*—
Michikami, Osamu; Katoh, Yujiro; Tanabe, Keiichi; Takenaka, Hisataka; and Yoshii, Shizuka, 4,412,902., Cl. 204-192.00E.

Katsuhiko, Nakamura: *See*—
Katsuhisa, Kohyama; Katsuhiko, Nakamura; and Akira, Matsuno, 4,413,103., Cl. 525-469.000.

Katsuhisa, Kohyama; Katsuhiko, Nakamura; and Akira, Matsuno, to Mitsubishi Chemical Industries., Ltd. Halogen-containing polycarbonate resin and process for producing same. 4,413,103., Cl. 525-469.000.

Kau, Karl M.: *See*—
Buddendeck, Gerald A.; and Kau, Karl M., 4,412,740., Cl. 355-14.0SH.

Kaufman, Benjamin J.; and Sweeney, William M., to Texaco Inc. Ethanol or gasohol fuel composition containing as inhibitor a reaction product of itaconic acid and mono-oleyl-1,3-diaminopropane. 4,412,845., Cl. 44-53.000.

Kavesh, Sheldon; and Prevorsek, Dusan C., to Allied Corporation. High tenacity, high modulus polyethylene and polypropylene fibers and intermediates therefore. 4,413,110., Cl. 526-348.100.

Kawakami, Yoshio: *See*—
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295., Cl. 360-110.000.

Kawakubo, Takamasa, to Mitsubishi Pencil Co., Ltd. Carbon spring and process for preparing the same. 4,412,675., Cl. 267-167.000.

Kawanami, Shumpei; Watanabe, Yasuo; and Hanyo, Susumu, to Dai-Ichi High Frequency Co., Ltd. Method for bending a metal pipe. 4,412,442., Cl. 72-128.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, 4,412,810., Cl. 431-186.000.

Kawasaki Kasei Chemicals Ltd.: *See*—
Komatsu, Tatsuyoshi; and Usui, Kenji, 4,412,954., Cl. 260-369.000.

Kawasaki, Kiyoshi: *See*—
Miyashita, Tsuneo; Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,412,862., Cl. 75-130.500.

Kawata, Hiroitsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, to Yamanouchi Pharmaceutical Co. Ltd. Nifedipine-containing solid preparation composition. 4,412,986., Cl. 424-80.000.

Kawata, Mitsuyasu: *See*—
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005., Cl. 424-285.000.

Kayser-Roth Hosiery, Inc.: *See*—
Safrit, Sam C.; Cassidy, Edward L.; and Euliss, Melvin C., 4,412,433., Cl. 66-177.000.

Kearney, Michael M.: *See*—
Schoenrock, Karlheinz W. R.; Kearney, Michael M.; and Rearick, D. Eugene, 4,412,866., Cl. 127-46.200.

Kearney-National Inc.: *See*—
Westrom, Arthur C.; Livesay, Billy R.; and Larsen, James W., 4,413,246., Cl. 337-159.000.

Kekish, George T.: *See*—
Collins, John H.; Lin, Mei-Jan L.; and Kekish, George T., 4,412,844., Cl. 44-51.000.

Kell, Michael J., to Cordis Dow Corp. Airless artificial kidney assembly. 4,412,916., Cl. 210-90.000.

Keller, J. Walter: *See*—
Schaldach, Max; and Keller, J. Walter, 4,412,541., Cl. 128-419.0PG.

Keller, Richard L. Grain drying and storage structure. 4,412,392., Cl. 34-233.000.

Keller, Viktor R.: *See*—
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857., Cl. 75-11.000.

Kelsey-Hayes Co.: *See*—
Prokop, B. Robert; and Trindle, Terry L., 4,412,690., Cl. 280-718.000.

Kendall, Robert M.: *See*—
Schreiber, Richard J.; Kesselring, John P.; and Kendall, Robert M., 4,412,523., Cl. 126-92.00C.

Kenny, Andrew A., to Eaton Corporation. Idle speed control system. 4,412,518., Cl. 123-339.000.

Kesselring, John P.: *See*—
Schreiber, Richard J.; Kesselring, John P.; and Kendall, Robert M., 4,412,523., Cl. 126-92.00C.

Ketel, William E., II, to Sun Electric Corporation. Method for detection of hydrocarbonaceous fuel in a fuel injection engine. 4,412,444., Cl. 73-23.000.

Kettinger, James G., to Phillips Petroleum Company. Specific gravity responsive control of BMCI in aromatic extract oils. 4,412,915., Cl. 208-311.000.

Kezerle, James A.: *See*—
Sheppard, Douglas B.; Kezerle, James A.; and Sheffield, Ellis W., 4,412,808., Cl. 431-8.000.

Khan, Mohammed N., to Dowty Electronics Limited. Vacuum deposition apparatus. 4,412,905., Cl. 204-298.000.

Khmelkov, Stanislav F.; Ramazanov, Mnaidar R.; Soldatov, Mikhail P.; Beskaravainy, Vadim V.; Aranovich, Viktor L.; and Soldaev, Lev K. Pigment for color-changing heat indicator. 4,412,936., Cl. 252-408.100.

Khoobiar, Sargis, to Halcon SD Group, Inc., The. Conversion of isobutane to methacrolein. 4,413,147., Cl. 568-476.000.

Khristoforov, Viktor P.: *See*—
Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857., Cl. 75-11.000.

Kibby, Charles L.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,413,064., Cl. 518-715.000.

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Sigl, Wayne C., 4,412,881., Cl. 156-164.000.

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Yamashita, Kunihiko; and Kimura, Muneaki, 4,412,908., Cl. 208-8.00R.

Kingsley, Michael C. Method and apparatus for attaching sun visor to an automobile. 4,412,698., Cl. 296-97.00A.

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Kinzel, Augustus B. Three wheeled vehicle. 4,412,595., Cl. 180-211.000.

Kirk, Norbert A. Blade housing for cast cutting tool. 4,412,381., Cl. 30-124.000.

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Kitahara, Makoto: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,413,045., Cl. 430-59.000.

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Brandt, Lothar; Holst, Arno; and Kleiner, Hans-Jerg, 4,413,121., Cl. 536-44.000.

Kleiner, Walter, to Staeubli Ltd. Multiposition dobby. 4,412,563., Cl. 139-66.00R.

Klenzaids Engineers Private Limited: *See*—
Shahani, Chandru M., 4,412,849., Cl. 55-97.000.

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Megerle, Friedrich, 4,412,583., Cl. 165-95.000.

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Mourou, Gerard A.; and Knox, Wayne H., 4,413,178., Cl. 250-213.0VT.

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Kobayashi, Hiroshi: *See*—
Tanaka, Motoharu; Machida, Hazime; and Kobayashi, Hiroshi, 4,413,297., Cl. 360-119.000.

Kobayashi, Ikutaro: *See*—
Matsuoka, Shoji; Kobayashi, Ikutaro; and Minowa, Junichiro, 4,413,179., Cl. 250-232.000.

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Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538., Cl. 128-303.100.

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Kobylinski, T. P.: *See*—
Beuther, Harold; Kibby, Charles L.; Kobylinski, T. P.; and Pannell, Richard B., 4,413,064., Cl. 518-715.000.

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Schilling, Wilfried; Lorenz, Siegberg; and Koch, Friedrich, 4,413,175., Cl. 377-25.000.

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Scholl, Hans, 4,412,498., Cl. 112-313.000.

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Grosshauser, Heinrich K., 4,412,490., Cl. 101-219.000.

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Kohl, Vance L., to McQuay Inc. Ice cube making. 4,412,429., Cl. 62-347.000.

Kohler, Norbert: *See*—
Ballerini, Daniel; Chaude, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastele, Jean-Paul, 4,412,925., Cl. 252-8.55D.

Koike, Keiichi; and Yanadori, Michio, to Hitachi, Ltd.; and Hitachi Plant Engineering and Construction Co., Ltd. Heat-storing composition. 4,412,930., Cl. 252-70.000.

Kokado, Masayuki: *See*—
Sumi, Hideji; and Kokado, Masayuki, 4,413,300., Cl. 361-98.000.

Kolbanovsky, July A.; Tsagareli, Romeo V.; and Schipachev, Viktor S., to Institut Neftekhimicheskogo Sinteza Imeni A.V. Topchieva Akademii Nauk SSSR. Method of controlling inlet valves of compression reactor and device for effecting same. 4,412,552., Cl. 137-14.000.

Kollmann, Horst, to Schelling & Co., Firma. Apparatus for centering alignment of planar workpieces. 4,412,769., Cl. 414-36.000.

Komatsu, Tatsuyoshi; and Usui, Kenji, to Kawasaki Kasei Chemicals Ltd. Process for producing 1,4,4a,9a-tetrahydroanthraquinone compound. 4,412,954., Cl. 260-369.000.

Kondo, Hiroshi; and Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Swash-plate type compressor having an improved lubricant oil feeding arrangement. 4,412,787., Cl. 417-269.000.

Kopp, Clinton V.; and Hitchcock, James, to Baxter Travenol Laboratories, Inc. Device to control the transmembrane pressure in a plasmapheresis system. 4,412,553., Cl. 137-118.000.

Koppers Company, Inc.: *See*—
Wallace, William E.; Sinha, Vijay K.; and Purarian, Faiz, 4,412,982., Cl. 423-644.000.
Zavodszky, Tamas, 4,412,579., Cl. 164-413.000.

Kornbaum, Simon; and Chenard, Jean-Yves, to Ato Chimie. Process for rendering polymers resistant to ionizing radiation, and compositions obtained thereby. 4,412,897., Cl. 204-159.200.

Kosonen, Ahti; and Palmu, Mauri, to Outokumpu Oy. Method of manufacturing a thin copper plate with flow conduits. 4,412,373., Cl. 29-157.30V.

Kosters, Larry J., to Roto Press Limited. Silo bag filling machine. 4,412,567., Cl. 141-114.000.

Kottgen GmbH & Co. Kommanditgesellschaft: *See*—
Gronau, Jurgen, 4,413,210., Cl. 318-16.000.

Kovac, Zalata: *See*—
Aviram, Ari; Kovac, Zalata; and Myers, Robert A., 4,413,266., Cl. 346-21.000.

Kovach, Stephen M.: *See*—
Hettinger, William P., Jr.; Hoffman, James F.; and Kovach, Stephen M., 4,412,914., Cl. 208-253.000.

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Reiter, Udo; Kovacs, Jenoe; and Schenck, Hans-Uwe, 4,413,117., Cl. 528-497.000.

Kowalski, Gunter, to U.S. Philips Corporation. Computer tomography apparatus. 4,413,351., Cl. 378-19.000.

Kowalski, Jeffrey M.: *See*—
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Yasuda, Shuhei; Koyanagi, Katsubumi; Ishii, Yutaka; and Wada, Tomio, 4,413,256., Cl. 340-784.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Scholz, Manfred; and Fricker, Wolfgang-Peter, 4,412,408., Cl. 52-806.000.

Kramer, Albert: *See*—
Ouwerkerk, Johannes H. W.; Kramer, Albert; and Mooij, Johannes W., 4,412,479., Cl. 98-36.000.

Kramer, Gordon; Lara, Elias J.; and Wollmann, Andrew F., to Beckman Instruments, Inc. Conductive particle lead termination for an electro-optic display. 4,413,257., Cl. 340-815.010.

Kramer, Louis T.; Butler, Franklin H.; and Callas, Donald C., to McDonnell Douglas Corporation. 3-Wheeled levered trailing beam landing gear. 4,412,665., Cl. 244-102.00R.

Krasovsky, Jury V.: *See*—
Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438., Cl. 72-10.000.

Krautkremer, Franz, to Schottel-Werft, Josef Becker GmbH & Co. KG. Drive mechanism for ships or the like comprising a main propeller and an auxiliary mechanism. 4,412,500., Cl. 114-151.000.

Krempl, Peter; Claassen, Peter; and List, Helmut, to List, Hans. Transducer with a flexible sensor element for measurement of mechanical values. 4,413,202., Cl. 310-338.000.

Kreuzmann, Alvin B. Method for the recovery of uranium values from uranium tetrafluoride. 4,412,861., Cl. 75-84.10R.

Krone GmbH: *See*—
Forberg, Horst; Achtnig, Klaus-Peter; and Stoewe, Anneliese, 4,412,374., Cl. 29-566.400.

Kroymann, Howard B.: *See*—
Lutz, Michael A.; Kroymann, Howard B.; Tayeb, Abdul M.; and Softky, Edward H., 4,413,259., Cl. 340-825.060.

Krueger, William R.: *See*—
Cavil, David T.; and Krueger, William R., 4,413,215., Cl. 318-588.000.

Kruehler, Wolfgang: *See*—
Plaettner, Rolf; and Kruehler, Wolfgang, 4,412,935., Cl. 252-188.100.

Kruger, Manfred, to Bosch-Siemens Hausgerate GmbH. Method of automatically controlling the drying process in a laundry-drying system, and equipment for performing the method. 4,412,389., Cl. 34-46.000.

Kruglewicz, Anne M.: *See*—
Gavin, Francis M.; and Kruglewicz, Anne M., 4,413,089., Cl. 524-785.000.

Krupka, Yaakov; Bachar, Avi; and Yerushalmi, Shmuel. Micropower system. 4,413,224., Cl. 323-222.000.

Krutchen, Charles M.: *See*—
DiBiasi, Daniel J.; and Krutchen, Charles M., 4,412,961., Cl. 264-40.100.

Kubas, Robert J., to American Cyanamid Company. Microsurgical foam needle control package. 4,412,613., Cl. 206-63.300.

Kubicek, Donald H., to Phillips Petroleum Company. Conversion of hydrogen sulfide to sulfur by direct oxidation. 4,412,981., Cl. 423-573.00R.

Kubota Ltd.: *See*—
Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802., Cl. 425-392.000.

Kubota, Nobunori: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,412,413., Cl. 57-304.000.

Kuhn, Edgar: *See*—
Gansert, Willi; Munz, Ulrich; and Kuhn, Edgar, 4,413,222., Cl. 320-48.000.

Kulik, Joseph S., Jr.: *See*—
Karlotski, Robert J.; Kulik, Joseph S., Jr.; and Muzeroll, Martin E., 4,413,206., Cl. 313-601.000.

Kulin, Ralph; Moncrief, Jack W.; Popovich, Robert P.; and Stauber, Ronald C., to Baxter Travenol Laboratories, by said Ralph Kulin and Ronald C. Stauber. Antimicrobial ultraviolet irradiation of connector for continuous ambulatory peritoneal dialysis. 4,412,834., Cl. 604-29.000.

Kulwiec, Leonard J.; and Kulwiec, Michael F. X. Removable partial dental prosthesis and method of forming and supporting the same. 4,412,824., Cl. 433-170.000.

Kulwiec, Michael F. X.: *See*—
Kulwiec, Leonard J.; and Kulwiec, Michael F. X., 4,412,824., Cl. 433-170.000.

Kumar, Ananda H.; McMillan, Peter W.; and Tummala, Rao R., to International Business Machines Corporation. Glass-ceramic structures and sintered multilayer substrates thereof with circuit patterns of gold, silver or copper. 4,413,061., Cl. 501-7.000.

Kummel, Friedrich; Hennecke, Rudolf; and Schubert, Manfred, to Unrath, Ludwig; and Delmag-Maschinenfabrik Reinhold Dornfeld GmbH & Co. Vibration machine for compacting materials, in particular an earth compacting machine. 4,412,757., Cl. 404-113.000.

Kunkel, Heinrich: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,412,372., Cl. 29-149.50R.

Kunz, Willy: *See*—
Reichmuth, Arthur; and Kunz, Willy, 4,412,591., Cl. 177-1.000.

Kurachi, Hisao; Itoh, Takeo; and Onoda, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Typewriter with an erasing apparatus. 4,412,755., Cl. 400-697.100.

Kurakake, Mitsuo, to Fujitsu Fanuc Limited. Addressing system. 4,413,315., Cl. 364-200.000.

Kurashige, Tomozo; and Shimada, Hidetoshi, to Idemitsu Kosan Co., Ltd. Asphalt compositions and a vibration-damping sheet formed by the same. 4,412,864., Cl. 106-235.000.

Kurata, Chikatoshi: *See*—
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, 4,412,810., Cl. 431-186.000.

Kurata, Tonio; and Fuji, Hiroshi, to Neat Shujinki Kogyo Kabushiki Kaisha. Electric dust collector. 4,412,850., Cl. 55-130.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Mizuno, Toshiya; and Murayama, Naohiro, 4,413,095., Cl. 525-199.000.
Shoji, Masuhiro; Sakagami, Teruo; and Murayama, Naohiro, 4,413,090., Cl. 525-59.000.

Kurimoto Iron Works, Ltd.: *See*—
Sakaguchi, Keizo; and Takeuchi, Shigeru, 4,412,561., Cl. 138-174.000.

Kurtz, Robert J.; and LiCausi, Joseph, to BioResearch. Orthopedic foot splint. 4,412,536., Cl. 128-80.00A.

Kurumada, Tomoyuki: *See*—
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,413,076., Cl. 524-102.000.

Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, to Dr. C. Otto & Comp. G.m.b.H. Apparatus for overhauling and repairing doors of horizontal coke-oven batteries. 4,412,776., Cl. 414-684.300.

Kyomen, Junsuke: *See*—
Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802., Cl. 425-392.000.

Kyster, Erik: *See*—
Thomsen, Svend E.; and Kyster, Erik, 4,412,415., Cl. 60-384.000.

LaBorde, Russell G.; and Jendrzejek, Gary S., to Oilgear Company, The. Intensifier pump with integrated check valve. 4,412,792., Cl. 417-454.000.

La Conte, Ruth A. Tray for grooming instruments. 4,412,618., Cl. 206-581.000.

Lacour, Alain P.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001., Cl. 424-272.000.

La Fever, William C. Spill resistant disposable paper drinking cup. 4,412,644., Cl. 229-1.50B.

Laflamme, Daniel C., to D C L Microelectronics, Inc. Calculator for guitar chords. 4,412,473., Cl. 84-485.00R.

Laine, Robert, to Agence Spatiale Europeene. Cryogenic apparatus suitable for operations in zero gravity. 4,412,851., Cl. 55-160.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Nicolas, Jacques; Berger, Antoine; and Laminette, Christian, 4,412,974., Cl. 422-156.000.

Lal, Mahendra, to Copeland Corporation. Refrigeration compressor apparatus and method of assembly. 4,412,791., Cl. 417-312.000.

Lamanna, Richard A.: *See*—
Anderson, Ronald W.; and Lamanna, Richard A., 4,413,015., Cl. 426-131.000.

Lamb Technicon Corp.: *See*—
Wright, Lawrence B., 4,412,465., Cl. 82-1.200.

Lambert, Clifford L.: *See*—
Nieh, Edward C. Y.; Naylor, Carter G.; and Lambert, Clifford L., 4,412,926., Cl. 252-8.55D.

Laminette, Christian: *See*—
Nicolas, Jacques; Berger, Antoine; and Laminette, Christian, 4,412,974., Cl. 422-156.000.

Lampe, Guy W.: *See*—
Molitor, Edwin A.; Crowe, Norman P.; and Lampe, Guy W., 4,412,775., Cl. 414-626.000.

Lampert, Heinz, to Lanker, Willy, a part interest. Measuring use of heat or the like at individual zones supplied from one source. 4,412,647., Cl. 236-36.000.

Lamphere, Craig F.: *See*—
Pecsok, Roger L.; McCrea, Ray G., Jr.; and Lamphere, Craig F., 4,413,298., Cl. 360-133.000.

Lancaster, David J.: *See*—
Cheary, Clifford M.; Lancaster, David J.; and Smith, Paul P., 4,413,303., Cl. 361-253.000.

Landa, Benzion. Cable driven plotter. 4,412,383., Cl. 33-1.00M.

Landa, Benzion, to Savin Corporation. Developing composition for a latent electrostatic image for transfer of the developed image across a gap to a carrier sheet. 4,413,048., Cl. 430-115.000.

Landers, Don B.: *See*—
Britton, Frederick G.; and Landers, Don B., 4,412,759., Cl. 405-225.000.

Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Reversible phase change compositions of calcium chloride hexahydrate with a potassium salt. 4,412,931., Cl. 252-70.000.

Langlois, Michel: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Philippe L., 4,413,001., Cl. 424-272.000.

Lanker, Willy: *See*—
Lampert, Heinz, 4,412,647., Cl. 236-36.000.

Laprad, Paul J.; and Wolanin, Gerald L., to Whirlpool Corporation. Gravity-operated latch for tilt-out console for dishwasher. 4,412,710., Cl. 312-311.000.

Lara, Elias J.: *See*—
Kramer, Gordon; Lara, Elias J.; and Wollmann, Andrew F., 4,413,257., Cl. 340-815.010.

Larikka, Leo, to G. A. Serlachius Oy. Method for forming an enlarged flanged hole in a curved surface. 4,412,441., Cl. 72-71.000.

Larsen, James W.: *See*—
Westrom, Arthur C.; Livesay, Billy R.; and Larsen, James W., 4,413,246., Cl. 337-159.000.

Laurel Bank Machine Co., Ltd.: *See*—
Watanabe, Kenkichi; and Hata, Setsuo, 4,412,550., Cl. 133-8.00A.

Laurent, Jacques: *See*—
Gasc, Jean-Claude; Geoffre, Serge; Hospital, Michel; and Laurent, Jacques, 4,412,988., Cl. 424-177.000.

Lavagnino, Edward R.: *See*—
Campbell, Jack B.; and Lavagnino, Edward R., 4,413,126., Cl. 546-52.000.

Lavender, Michael R., to Gentex Corporation. Individually fitted helmet liner and method of making same. 4,412,358., Cl. 2-412.000.

Layden, George K., to United Technologies Corporation. Method of producing fiber reinforced glass matrix composite articles of complex shape. 4,412,854., Cl. 65-18.100.

Layfield, James D.: *See*—
Todd, David B.; and Layfield, James D., 4,412,964., Cl. 264-143.000.

Lebet, Jean-Pierre; and Berney, Michel, to Baumgartner Papiers, S.A. Production of cigarette filter units. 4,412,829., Cl. 493-48.000.

LeBlanc, Richard E.: *See*—
Porter, Ronald G.; LeBlanc, Richard E.; and Siemon, Rolf W., 4,413,250., Cl. 340-310.00A.

Lebrun, Jean L., to Societe Fracaise d'Equipements pour la Navigation Aerienne S.F.E.N.A. Rapid detector of a wind gradient. 4,413,321., Cl. 364-428.000.

Le Brun, Jean-Yves: *See*—
Renoulin, Roger; and Le Brun, Jean-Yves, 4,413,338., Cl. 370-89.000.

Le Coent, Jean-Louis: *See*—
Demoures, Bernard; and Le Coent, Jean-Louis, 4,412,927., Cl. 252-33.300.

Lecreff, Maurice: *See*—
Bitoune, Sylviane; Dufond, Pierre; Herrbach, Francois; and Lecreff, Maurice, 4,413,241., Cl. 333-22.00R.

Lee, Byron D. Folding support frame for stroller or the like. 4,412,689., Cl. 280-648.000.

Lee, Jerald D.; and Reilly, Charles D., to Du Pont de Nemours, E. I., and Company. Absolute spectrophotometer. 4,412,744., Cl. 356-319.000.

Lee, Kyu-Wang: *See*—
Chang, Wen-Hsuan; Lee, Kyu-Wang; and Saunders, John B., Jr., 4,413,086., Cl. 524-386.000.

Lee, Wooyoung: *See*—
Garwood, William E.; and Lee, Wooyoung, 4,413,153., Cl. 585-304.000.

LeFranc, Christiane; and Verdier, Francois. Telescoping grandstand arrangement. 4,412,403., Cl. 52-9.000.

Le Fur, Daniel: *See*—
Goldman, Alice; and Le Fur, Daniel, 4,412,960., Cl. 264-22.000.

Legrand, Paul J.; Notheaux, Andre R.; Pachomoff, Guy R.; and Romanoff, Alexis M. G., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Apparatus for the installation of a jet engine in an aircraft compartment. 4,412,774., Cl. 414-589.000.

Lemattre, Maurice; Roussel, Robert; and Wirth, Rene, to Societe Chimique des Charbonnages. Process of preparation of graft copolymer of styrene and an EPDM rubber. 4,412,896., Cl. 204-159.200.

Lemke, James U.; and French, William W., to Eastman Technology Inc. Method of manufacturing a multitrack magnetic head employing double helix structure. 4,412,379., Cl. 29-603.000.

Lenko, Daniel S., to United States of America, Navy. Digital compass having a ratiometric bearing processor. 4,412,387., Cl. 33-361.000.

Lennon, Donald J.: *See*—
Beaudet, Leo A.; and Lennon, Donald J., 4,413,049., Cl. 430-126.000.

Leonard, Frank W. Press construction. 4,412,486., Cl. 100-229.00R.

Lepisto, J. George, to Champion International Corporation. Self-sealing bag sleeve. 4,412,645., Cl. 383-48.000.

Lepley, Richard H.; and Happel, Thomas A., to Pfizer Inc. Pneumatic unloading of particulates. 4,412,762., Cl. 406-134.000.

Lerner, Bernard; and Liebhart, Dana J., to Automated Packaging Systems, Inc. Labeling apparatus. 4,412,876., Cl. 156-64.000.

Leroy, Claude, to Sorelec. Inflatable-structure apparatus for cooling a heat exchange fluid. 4,412,430., Cl. 62-467.00R.

Lettington, Alan H.: *See*—
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Leung, Pak S.; and Cacciola, Anthony R., to Union Carbide Corporation. Dry, particulate, inorganic ultrafiltration membranes and the production thereof. 4,412,921., Cl. 210-500.200.

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Mita Industrial Co., Ltd.: *See*—
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Bost, Jonathan R., 4,413,198., Cl. 310-324.000.
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Green, Geoffrey W.; and Lettington, Alan H., 4,412,903., Cl. 204-192.00C.
Lloyd, Peter H., 4,412,742., Cl. 356-73.000.
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Herborn, Peter E.; Liu, Thomas T.; and Young, Sze-Teh, 4,412,731., Cl. 354-299.000.
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Patrichi, Mihai D.; and Evanson, Delbert L., 4,412,420., Cl. 60-635.000.
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Springer, Paul H., 4,412,368., Cl. 24-158.000.
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Streich, Steven G.; Nickles, R. Benton; and Treece, Harold O., 4,412,559., Cl. 138-89.000.
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Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039., Cl. 428-643.000.
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Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,412,517., Cl. 123-339.000.
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Nishikawa, Masaji, to Olympus Optical Company Ltd. Electrophotographic copying process. 4,413,044., Cl. 430-53.000.
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Hayashi, Yoshimasa, 4,412,516., Cl. 123-198.00E.
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Andre, Wieme, 4,412,687., Cl. 280-610.000.
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Caletti, Bruno, 4,412,639., Cl. 226-197.000.
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Ouwerkerk, Johannes H. W.; Kramer, Albert; and Mooij, Johannes W., to Estel Hoogovens B.V. Gas flow arrangement. 4,412,479., Cl. 98-36.000.
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Palka, James J., to Pace Industries Inc. Cabinet door hinge construction. 4,412,708., Cl. 312-138.00R.
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Panzer, George W.; and Nehmsmann, Louis J., to Alcolac, Inc. High foaming, low eye irritation cleaning compositions containing ethoxylated anionic (C13-C30) sulphates. 4,412,944., Cl. 252-551.000.
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Pawletko, Joseph P.; and Pigos, Charles R., to International Business Machines Corporation. Method of and apparatus for controlling gray scale while printing on charge sensitive recording mediums. 4,413,269., Cl. 346-154.000.
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Pedrosa Junior, Oswaldo A.; Castro Couto, Nilton; and Carvalho Fangueiro, Raul C., to Petroleo Brasileiro S.A. - Petrobras. High capacity oil burner. 4,412,811., Cl. 431-202.000.
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Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201., Cl. 310-260.000.
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Potter, Terry A.: *See—*
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Powell, Lawson W.: *See—*
Chester, Ian R.; Powell, Lawson W.; and Roberts, David G., 4,413,056., Cl. 435-43.000.
Powers, Frank M.: *See—*
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PPG Industries, Inc.: *See—*
Chang, Wen-Hsuan; Lee, Kyu-Wang; and Saunders, John B., Jr., 4,413,086., Cl. 524-386.000.
Freiberg, James M., 4,412,739., Cl. 355-89.000.
Neely, James E., Jr., 4,412,863., Cl. 106-84.000.
Temple, Chester S., 4,413,085., Cl. 524-321.000.
Prasad, Arun, to Jeneric Industries, Inc. Palladium based dental alloys. 4,412,970., Cl. 420-463.000.
Premo, John G.: *See—*
Phillips, Kenneth G.; and Premo, John G., 4,413,143., Cl. 564-128.000.
President and Fellows of Harvard College: *See—*
Fossel, Eric T.; and Ingwall, Joanne S., 4,413,233., Cl. 324-300.000.
Presley, Rex W., to Bendix Corporation, The. Ultra-high torque actuators. 4,412,794., Cl. 418-61.00R.
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Pribat, Didier: *See—*
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Probst, Nicolas J.; Iker, Jean; and Autin, Jacques, to Phillips Petroleum Company. Recording disc compositions comprising polymers of monovinyl-substituted hydrocarbons, conductive carbon black and lubricants. 4,412,941., Cl. 252-511.000.

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Chung, Stanley Y.; and Spadini, Gianfranco L., 4,412,934., Cl. 252-186.380.
Van Laer, Albert, 4,412,619., Cl. 206-611.000.
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Prokop, B. Robert; and Trindle, Terry L., to Kelsey-Hayes Co. Suspension system. 4,412,690., Cl. 280-718.000.
Prototech Company: *See—*
Juda, Walter; Allen, Robert J.; and Bar-Ilan, Amiram, 4,412,894., Cl. 204-119.000.
Proud, Joseph M.: *See—*
Byszewski, Wojciech W.; Budinger, A. Bowman; Proud, Joseph M.; and Riseberg, Leslie A., 4,413,204., Cl. 313-491.000.
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Parizot, William D.; O'Lenick, Paul D.; and Fraley, Lowell D., 4,412,975., Cl. 422-197.000.
Purarian, Faiz: *See—*
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Purdue Research Foundation: *See—*
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Q Corporation: *See—*
Smith, E. Quimby, Jr., 4,412,421., Cl. 60-643.000.
Quaker Oats Company, The: *See—*
Webster, Francis, 4,413,018., Cl. 426-618.000.
Quantronix Corporation: *See—*
Cohen, Martin G.; and Liu, Kuo-ching, 4,413,342., Cl. 372-22.000.
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Quick, Roy F., Jr.; and Spracklen, John E., to Burroughs Corporation. Interconnection for local area contention networks. 4,413,258., Cl. 340-825.500.
Raffelson, Harold: *See—*
Mount, Ramon A.; and Raffelson, Harold, 4,412,940., Cl. 502-209.000.
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Beatty, William T., 4,412,602., Cl. 188-53.000.
RAJ Technology Partnership: *See—*
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Ralston Purina Company: *See—*
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Ramazanov, Mnaidar R.: *See—*
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Cohen, Sherman E.; Ramazzotti, Dario; and Hartley, Michael D., 4,413,255., Cl. 340-622.000.
Ramsden, Scott C.; and Braman, John C., to Bechtel International Corporation. Beaded liquid apparatus and method. 4,412,673., Cl. 254-134.3FT.
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Ottaviano, Gary W., 4,412,879., Cl. 156-145.000.
Ratelband, John B. Fire-guard. 4,412,524., Cl. 126-121.000.
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Raychem Corporation: *See—*
Diaz, Stephen H., 4,413,028., Cl. 428-36.000.
Lutz, Michael A.; Kroymann, Howard B.; Tayeb, Abdul M.; and Softky, Edward H., 4,413,259., Cl. 340-825.060.
Middleman, Lee M.; and Doljack, Frank, 4,413,301., Cl. 361-106.000.
Raytheon Company: *See—*
Martel, Thomas J.; and Bowen, Robert F., 4,413,167., Cl. 219-10.55E.
Metal, Israel; and Berluti, Vincent, Jr., 4,413,183., Cl. 250-363.00S.
Teich, Wesley W., 4,413,168., Cl. 219-10.55B.
RCA Corporation: *See—*
Hurst, Robert N., 4,413,288., Cl. 360-31.000.
Wargo, Robert A., 4,413,282., Cl. 358-167.000.
Rearick, D. Eugene: *See—*
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Reed Rock Bit Company: *See—*
Daly, Jeffery E., 4,412,590., Cl. 175-229.000.
Reeves, Albert H.; and Michalski, Joseph S., to Litton Systems, Inc. Hybrid tee waveguide assembly. 4,413,242., Cl. 333-122.000.
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Rehkemper, Steven F.; and Morrison, Howard J., to Marvin Glass & Associates. Action game device. 4,412,682., Cl. 273-1.0GG.
Reich, Andreas: *See—*
Rohr, Franz-Josef; and Reich, Andreas, 4,412,904., Cl. 204-424.000.
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Reichle, Walter T.: *See—*
Conte, Louis B., Jr.; and Reichle, Walter T., 4,413,123., Cl. 544-215.000.
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Reiff, Helmut; and Sachs, Hanns I., to Bayer Aktiengesellschaft. Emulsifiers, aqueous isocyanate emulsions containing them and their use as binders in a process for the manufacture of molded articles. 4,413,112., Cl. 528-73.000.
Reifferscheid, Karl J.: *See—*
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Reifschneider, Walter, to Dow Chemical Company, The. N-((Alkylamino)carbonyl)-N-(((alkylamino)carbonyl)oxy)acylamides with antineoplastic activity. 4,413,009., Cl. 424-298.000.
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Reilly Tar & Chemical Corp.: *See—*
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Reimer, William A.; and Bertellotti, Ansano, to GTE Automatic Electric Labs Inc. Circuit board positioning arrangement. 4,412,712., Cl. 339-17.00M.
Reiner, Alberto, to Crinos Farmacologica Spa. Pyridoxine derivatives and related pharmaceutical compositions. 4,412,996., Cl. 424-256.000.
Reinwald, Elmar: *See—*
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Reisinger, Konrad: *See—*
Chaillie, Charles; and Reisinger, Konrad, 4,413,336., Cl. 370-48.000.
Reiter, Udo; Kovacs, Jenoe; and Schenck, Hans-Uwe, to BASF Aktiengesellschaft. Preparation of polyimide powder. 4,413,117., Cl. 528-497.000.
Reitz, Richard J.: *See—*
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Reliance Electric Company: *See—*
Baumgarten, Arthur A., Jr., 4,413,213., Cl. 318-332.000.
Rembaum, Alan, to California Institute of Technology. Polyacrolein microspheres. 4,413,070., Cl. 523-223.000.
Remy, David C.; and Clineschmidt, Bradley V., to Merck & Co., Inc. Anti-emetic esters of cyproheptadine-3-carboxylic acid and structurally related compounds. 4,412,999., Cl. 424-267.000.
Renga, James M.; and Periana-Pillai, Roy A., to Dow Chemical Company, The. Process for making vicinal epoxides. 4,413,137., Cl. 549-518.000.
Renoulin, Roger; and Le Brun, Jean-Yves. Communication system for interconnecting a plurality of asynchronous data processing terminals. 4,413,338., Cl. 370-89.000.
Repic, Oljan: *See—*
Hardtmann, Goetz E.; Repic, Oljan; and Vogt, Susi, 4,412,952., Cl. 260-239.30D.
Reum, Helmut: *See—*
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Reuter, Knud; Dhein, Rolf; and Fleiter, Lothar, to Bayer Aktiengesellschaft. Process for the preparation of polyesters or alkyd resins, resins which may be obtained according to this process and the use thereof as lacquer binders. 4,413,116., Cl. 528-307.000.
Rhodes, James S.: *See—*
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Rhone-Poulenc Industries: *See—*
Ballerini, Daniel; Chaude, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastele, Jean-Paul, 4,412,925., Cl. 252-8.55D.
Locatelli, Jean-Louis, 4,413,107., Cl. 526-262.000.
Richardson, Larry S.: *See—*
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Richter, Dag: *See—*
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Rickett, David A. Automatic and continuous chemical feed system. 4,412,918., Cl. 210-169.000.
Rico', Tiziano, to Salvarani S.p.A. Very thick shaped laminated plastic. 4,412,883., Cl. 156-222.000.
Ricoh Company, Ltd.: *See—*
Ogata, Yoshihiro; Abe, Yoshihiro; and Takahashi, Harumi, 4,412,732., Cl. 355-3.0TR.
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Rieck, Lothar: *See—*
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Riggle, Charles M.; Weng, Lih-Jyh; and Field, Norman A., to Digital Equipment Corporation. Multiple error detecting and correcting system employing Reed-Solomon codes. 4,413,339., Cl. 371-38.000.

Ripkens, Hans-Gerd: *See*—
Teetz, Wolfgang; Slomma, Heinz-Georg; and Ripkens, Hans-Gerd, 4,412,497., Cl. 112-96.000.

Riseberg, Leslie A.: *See*—
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Rizzo, Victor L., to Upjohn Company, The. Sulfonamide compounds, compositions and methods for combatting insects. 4,413,013., Cl. 424-321.000.

Robatel SLPI: *See*—
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Robert Bosch GmbH: *See*—
Gansert, Willi; Munz, Ulrich; and Kuhn, Edgar, 4,413,222., Cl. 320-48.000.
Hafner, Udo, 4,413,244., Cl. 335-250.000.
Linder, Ernst; Maurer, Helmut; Muller, Klaus; and Reum, Helmut, 4,412,446., Cl. 73-35.000.
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Roberts, David G.: *See*—
Chester, Ian R.; Powell, Lawson W.; and Roberts, David G., 4,413,056., Cl. 435-43.000.

Roberts, F. Edward; and Grenda, Victor J., to Merck & Co., Inc. Process for removal of homogeneous catalyst group VIII metals from process streams. 4,413,118., Cl. 536-7.100.

Robertshaw Controls Company: *See*—
Tyler, Hugh J.; and Conway, William H., 4,413,252., Cl. 340-365.00C.

Robinson, Jeffrey I., to Texas Instruments Incorporated. Electrical inverters. 4,413,313., Cl. 363-80.000.

Robson, Charles H. Apparatus for collecting and distributing pollen. 4,412,363., Cl. 6-4.00R.

Roche, William J., to GTE Products Corporation. Series-connected discharge device ballast apparatus. 4,413,209., Cl. 315-101.000.

Rock, Erich; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Adjustable hinge. 4,412,366., Cl. 16-236.000.

Rockwell International Cororation: *See*—
Dyke, Harry J., 4,413,240., Cl. 333-17.00R.

Rogers Corporation: *See*—
Bessette, Michael D.; and Jerard, Robert B., 4,412,962., Cl. 264-46.400.

Rogers, Ralph W., Jr.: *See*—
Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,412,869., Cl. 148-2.000.
Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,412,870., Cl. 148-2.000.

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Rohm and Haas Company: *See*—
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Rohr, Franz-Josef; and Reich, Andreas, to Brown, Boveri & Cie AG. Electrochemical measuring cell. 4,412,904., Cl. 204-424.000.

Roman, Walter G., to Westinghouse Electric Corp. Pumping apparatus. 4,412,785., Cl. 417-50.000.

Romanoff, Alexis M. G.: *See*—
Legrand, Paul J.; Notheaux, Andre R.; Pachomoff, Guy R.; and Romanoff, Alexis M. G., 4,412,774., Cl. 414-589.000.

Romeo, Donald E.; and McIver, George W., to United States of America, Navy. Field effect transistor circuit for modulator and demodulator applications. 4,413,239., Cl. 332-16.00T.

Ronnerholm, Stig: *See*—
Claesson, Kjell; Ronnerholm, Stig; and Strand, Rolf, 4,412,649., Cl. 236-46.00R.

Rosenberg, Avner. Clamping devices particularly useful as pipe couplings. 4,412,694., Cl. 285-178.000.

Rossi, Anthony J., to General Electric Company. Apparatus and method for controlling a multi-turbine installation. 4,412,422., Cl. 60-706.000.

Rossow, Harold E.: *See*—
Lane, George A.; and Rossow, Harold E., 4,412,931., Cl. 252-70.000.

Roto Press Limited: *See*—
Kosters, Larry J., 4,412,567., Cl. 141-114.000.

Roussel, Robert: *See*—
Lemattre, Maurice; Roussel, Robert; and Wirth, Rene, 4,412,896., Cl. 204-159.200.

Roussel Uclaf: *See*—
Gasc, Jean-Claude; Geoffre, Serge; Hospital, Michel; and Laurent, Jacques, 4,412,988., Cl. 424-177.000.
Zalisz, Rene; and Salles, Marie-France, 4,412,946., Cl. 260-112.00R.

Rowe, Linwood M., Jr.; Skinner, Dale D.; and Thompson, John H., to Westinghouse Electric Corp. Broad beam transducer. 4,413,331., Cl. 367-151.000.

Rowland-Hill, E. William, to Sperry Corporation. Combine harvester with improved cleaning. 4,412,549., Cl. 130-27.00T.

Rumsey, Lynn D.: *See*—
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Ruppel, Wolfgang: *See*—
Fuchs, Gottfried; Garrecht, Ewald; Rieck, Lothar; Ruppel, Wolfgang; Schwarz, Rudolf; and Siegle, Erich, 4,412,641., Cl. 228-37.000.

Rutecki, Daniel J. Spooled material dispenser/holder. 4,412,662., Cl. 242-125.300.

Ruyter, Thomas J., to Ballast-Nedam Groep N.V.; and Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V. Balanced supplemental water bleed for suction dredgers. 4,412,790., Cl. 417-306.000.

Ruzek, Ivo: *See*—
Hartmann, Ludwig; and Ruzek, Ivo, 4,413,032., Cl. 428-288.000.

Ryobi Ltd.: *See*—
Ishii, Koji, 4,412,488., Cl. 101-142.000.

S. C. Johnson & Son, Inc.: *See*—
Musiel, D. James; and Buhler, James E., 4,412,668., Cl. 248-346.000.

Saab-Scania Aktiebolag: *See*—
Bergman, Hans I.; and Nyman, Bjorn D., 4,412,592., Cl. 180-14.00A.

Saatze, Kuno, to Siemens Aktiengesellschaft. Transition piece for the conversion of a circular conductor arrangement of a cable or such into a linear conductor arrangement and conversely. 4,412,721., Cl. 350-96.200.

Sabo, Joseph D.; and Karp, Joel A., to United States of America, Navy. Radiation circumvention technique. 4,413,327., Cl. 364-900.000.

Sachs, Hanns I.: *See*—
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Sadowski, Joseph P.; Lightfoot, Alan E.; and Kowalski, Jeffrey M., to Mostek Corporation. Vertical semiconductor furnace. 4,412,812., Cl. 432-121.000.

Saegusa, Takashi; and Fukuhara, Toru, to Nippon Kogaku K.K. Metering device. 4,412,730., Cl. 354-31.000.

Safrit, Sam C.; Cassidy, Edward L.; and Eulisa, Melvin C., to Kayser-Roth Hosiery, Inc. Pantyhose with integrally knit crotch area. 4,412,433., Cl. 66-177.000.

Saito, Takashi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus. 4,413,333., Cl. 369-77.200.

Saji, Hideo: *See*—
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Sakagami, Teruo: *See*—
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Sakaguchi, Keizo; and Takeuchi, Shigeru, to Kurimoto Iron Works, Ltd. Glass fiber-reinforced cement non-plate articles. 4,412,561., Cl. 138-174.000.

Sakaguchi, Masayuki: *See*—
Ohta, Ryozo; Yoshizawa, Tadao; Sakaguchi, Masayuki; Hara, Yoshiaki; Kyomen, Junsuke; Yoneda, Ryuichi; and Enomoto, Hidekazu, 4,412,802., Cl. 425-392.000.

Sakaguchi, Shouzaburou: *See*—
Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, 4,413,291., Cl. 360-71.000.

Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiro, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a ferroelectric substrate plate. 4,412,886., Cl. 156-645.000.

Sakai, Akeo: *See*—
Kato, Hiroaki; Hamana, Junji; Sakai, Akeo; Kawakami, Yoshio; Goto, Atsushi; Amano, Saichiro; and Canon Denshi Kabushiki Kaisha, 4,413,295., Cl. 360-110.000.

Sakai, Hiroaki; and Okazaki, Tadanori, to Matsushita Electric Industrial Co., Ltd. Oral cavity cleaner. 4,412,823., Cl. 433-80.000.

Sakai, Kiyoshi: *See*—
Ishikawa, Shozo; Katagiri, Kazuharu; Watanabe, Katsunori; Sakai, Kiyoshi; and Kitahara, Makoto, 4,413,045., Cl. 430-59.000.

Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, to Murata Machinery, Ltd. Air current rectifier plate on an air spinning device. 4,412,413., Cl. 57-304.000.

Sakai, Takamasa: *See*—
Sato, Yasuhiko; Sakai, Takamasa; and Minagawa, Shoichi, 4,412,906., Cl. 204-298.000.

Sakamoto, Katsuyoshi: *See*—
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Sakamoto, Koji; and Tanzawa, Misao, to Ricoh Company, Ltd. Collection of suspended toner particles. 4,412,736., Cl. 355-15.000.

Sakane, Toshio; Madate, Haruhisa; and Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Focusing apparatus for eye-fundus examining instrument. 4,412,728., Cl. 351-206.000.

Sako, Yoichiro: *See*—
Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuo; Doi, Toshitada; and Vries, Lodewijk B., 4,413,340., Cl. 371-39.000.

Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,292., Cl. 360-72.200.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,299., Cl. 360-137.000.

Saleck, Wilhelm: *See*—
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Salkeld, Richard W.; Anderson, Neal P.; and Giamei, Anthony F., to United Technologies Corporation. Control of seed melt-back during directional solidification of metals. 4,412,577., Cl. 164-122.200.

Salles, Marie-France: *See*—
Zalisz, Rene; and Salles, Marie-France, 4,412,946., Cl. 260-112.00R.

Salvarani S.p.A.: *See*—
Rico', Tiziano, 4,412,883., Cl. 156-222.000.

Samputensili S.p.A.: *See*—
Occhialini, Carlo, 4,412,765., Cl. 409-6.000.

Sanders, Duane: *See*—
Crawford, Roger; and Sanders, Duane, 4,412,659., Cl. 241-35.000.

Sandhu, Jaswinder S., to RAJ Technology Partnership. Striating liquid crystal display substrates with ultrasonically cavitating bubble beams. 4,412,724., Cl. 350-341.000.

Sandoz, Inc.: *See*—
Hardtmann, Goetz E.; Repic, Oljan; and Vogt, Susi, 4,412,952., Cl. 260-239.30D.

Sandoz Ltd.: *See*—
Karanatsios, Dimitrios, 4,413,131., Cl. 548-461.000.

Sankar, Wilfred A. Total body protective shield. 4,412,495., Cl. 109-49.500.

Sankyo Company Ltd.: *See*—
Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,413,076., Cl. 524-102.000.

Sano, Shoichi: *See*—
Furukawa, Yoshimi; and Sano, Shoichi, 4,412,594., Cl. 180-140.000.

Santrade Ltd.: *See*—
Schmid, Herbert; and Schmid, Ernst, 4,412,767., Cl. 409-234.000.

Sanyo Electric Co., Ltd.: *See*—
Hosoya, Nobukazu, 4,413,274., Cl. 358-25.000.

Sargent & Greenleaf, Inc.: *See*—
Bechtiger, Charles G., 4,412,436., Cl. 70-272.000.

Sasaki, Hideyuki: *See*—
Kato, Yoshiaki; Fushida, Akira; Fukuda, Hideo; Nakazawa, Toru; Kamezaki, Yasushi; and Sasaki, Hideyuki, 4,413,047., Cl. 430-94.000.

Sasaki, Noriaki: *See*—
Shimada, Keizo; Mera, Hiroshi; Sasaki, Noriaki; and Aoki, Akihiro, 4,413,114., Cl. 528-183.000.

Sasaki, Sadayuki: *See*—
Miyashita, Tsuneo; Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,412,862., Cl. 75-130.500.

Sasano, Akira: *See*—
Tanaka, Yasuo; Sasano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, 4,412,900., Cl. 204-192.00P.

Sasserath, Arend: *See*—
Ford, Thomas H.; and Sasserath, Arend, 4,412,648., Cl. 236-42.000.

Sato, Kazuhiro: *See*—
Izumita, Morishi; Akiyama, Toshiyuki; Sato, Kazuhiro; and Nagahara, Shusaku, 4,413,284., Cl. 358-213.000.

Sato, Shinsaku: *See*—
Tsunoda, Sachio; and Sato, Shinsaku, 4,412,779., Cl. 415-1.000.

Sato, Tomio; Okimoto, Kunio; and Yamakawa, Toshio, to Director-General of the Agency of Industrial Science and Technology. Method for bonding of a porous body and a fusion-made body. 4,412,643., Cl. 228-221.000.

Sato, Yasuhiko; Sakai, Takamasa; and Minagawa, Shoichi, to Clarion Co., Ltd. Sputtering apparatus. 4,412,906., Cl. 204-298.000.

Saunders, John B., Jr.: *See*—
Chang, Wen-Hsuan; Lee, Kyu-Wang; and Saunders, John B., Jr., 4,413,086., Cl. 524-386.000.

Savin Corporation: *See*—
Landa, Benzion, 4,413,048., Cl. 430-115.000.

Sawada, Hiroomi: *See*—
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538., Cl. 128-303.100.

Sawada, Kengi: *See*—
Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, 4,412,538., Cl. 128-303.100.

Sawyer, Geoffrey S.: *See*—
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,412,427., Cl. 62-298.000.

Scarnato, Thomas J.: *See*—
Sorensen, Robert; Barrett, Edward A.; and Scarnato, Thomas J., 4,412,761., Cl. 406-98.000.

Scettri, Arrigo: *See*—
Piancatelli, Giovanni; Scettri, Arrigo; and Maurizio, D'Auria, 4,413,145., Cl. 568-345.000.

Schaefer Marine, Inc.: *See*—
Hall, Eric R. D., 4,412,499., Cl. 114-108.000.

Schafer, Wolfgang: *See*—
Eiermann, Kurt; and Schafer, Wolfgang, 4,412,449., Cl. 73-204.000.

Schaldach, Max; and Keller, J. Walter. Cardiac pacemaker. 4,412,541., Cl. 128-419.0PG.

Schelling & Co., Firma: *See*—
Kollmann, Horst, 4,412,769., Cl. 414-36.000.

Schenck, Hans-Uwe: *See*—
Reiter, Udo; Kovacs, Jenoe; and Schenck, Hans-Uwe, 4,413,117., Cl. 528-497.000.

Scherm, Arthur; Peteri, Dezsoe; and Hummel, Klaus, to Merz & Company. Certain 4-(1-piperidino)-phenyl-nicotinates. 4,412,998., Cl. 424-267.000.

Schetina, Otto: *See*—
Zitz, Alfred; Droscher, Erich; and Schetina, Otto, 4,412,700., Cl. 299-1.000.

Schiene, Karl: *See*—
Bartholomaus, Reiner; Gibas, Christoph; Wolfges, Hans; Hess, Ferdinand; and Schiene, Karl, 4,413,245., Cl. 336-84.00M.

Schieve, Edmund H., to Honeywell Information Systems Inc. Transport system. 4,412,609., Cl. 198-341.000.

Schilling, Wilfried; Lorenz, Siegberg; and Koch, Friedrich, to E.G.O. Regeltechnik GmbH. Heat level indication method and apparatus. 4,413,175., Cl. 377-25.000.

Schipachev, Viktor S.: *See*—
Kolbanovsky, July A.; Tsagareli, Romeo V.; and Schipachev, Viktor S., 4,412,552., Cl. 137-14.000.

Schlag, Johannes: *See*—
Naarmann, Herbert; Penzien, Klaus; Schlag, Johannes; and Simak, Petr, 4,412,942., Cl. 252-518.000.

Schlegel Corporation: *See*—
Weichman, Edward C., 4,413,033., Cl. 428-122.000.

Schlumberger, Jules; and Aebli, Heinrich, to Gautschi Electro-Fours AG. Sliding shoe for a pusher furnace. 4,412,816., Cl. 432-239.000.

Schmid, Ernst: *See*—
Schmid, Herbert; and Schmid, Ernst, 4,412,767., Cl. 409-234.000.

Schmid, Herbert; and Schmid, Ernst, to Santrade Ltd. Tool holder. 4,412,767., Cl. 409-234.000.

Schmid, Rolyn A., to Bender Machine Works, Inc. Valve apparatus for fluid conveying system. 4,412,557., Cl. 137-624.130.

Schmidgall, Ronald D., to Hawkeye Concrete Products Co. Canopy kiln system. 4,412,817., Cl. 432-247.000.

Schmidt, Heinrich, to Hein, Lehmann AG. Device for separating a filler mass. 4,412,865., Cl. 127-19.000.

Schmidt, Manfred. Teat feeding bottle having a pierceable wall and spike opening means. 4,412,623., Cl. 215-11.00R.

Schmidt, Manfred; and Yeater, Robert P., to Mobay Chemical Corporation. Thermoplastic polyurethane compositions of improved flame retardance. 4,413,101., Cl. 525-440.000.

Schmidt, Walter: *See*—
Donig, Gerhard; Schmidt, Walter; Schummer, Helmut; and Neulinger, Franz, 4,413,225., Cl. 323-246.000.

Schmitt, Gunter: *See*—
Paul, Gunter; Patel, Kirit; and Schmitt, Gunter, 4,412,412., Cl. 57-280.000.

Schmitt, Wilhelm E., to Friedman, Jack S. Brush. 4,412,365., Cl. 15-184.000.

Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., to Bristol-Myers Company. Triacylated derivative of scirpentriol. 4,413,134., Cl. 549-332.000.

Schnurbusch, Horst: *See*—
Disteldorf, Josef; Gras, Rainer; and Schnurbusch, Horst, 4,413,079., Cl. 524-169.000.

Schoendorfer, Donald W.: *See*—
Avery, Hollon B.; and Schoendorfer, Donald W., 4,412,831., Cl. 494-46.000.

Schoenrock, Karlheinz W. R.; Kearney, Michael M.; and Rearick, D. Eugene, to Amalgamated Sugar Company, The. Method and apparatus for the sorption and separation of dissolved constituents. 4,412,866., Cl. 127-46.200.

Scholl, Hans, to Kochs Adler AG. Control device for a differential feed of a sewing machine. 4,412,498., Cl. 112-313.000.

Scholz, Manfred; and Fricker, Wolfgang-Peter, to Kraftwerk Union Aktiengesellschaft. Heat-insulation building block of all-metal construction. 4,412,408., Cl. 52-806.000.

Schottel-Werft, Josef Becker GmbH & Co. KG: *See*—
Krautkremer, Franz, 4,412,500., Cl. 114-151.000.

Schreiber, Richard J.; Kesselring, John P.; and Kendall, Robert M., to Alzeta Corporation. Catalytic gas-fired furnace system and method. 4,412,523., Cl. 126-92.00C.

Schreiner, Friedrich; and Staberoh, Uwe, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Bearing assembly for transmission output shaft. 4,412,705., Cl. 308-178.000.

Schreyer, Gerd: *See*—
Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg, 4,413,021., Cl. 427-236.000.

Schubert, Manfred: *See*—
Kummel, Friedrich; Hennecke, Rudolf; and Schubert, Manfred, 4,412,757., Cl. 404-113.000.

Schucker, Robert C.; and Wheelock, Kenneth S., to Exxon Research and Engineering Co. Process for reactivating perovskite catalysts and hydrocarbon treating processes utilizing the reactivated catalysts. 4,412,911., Cl. 208-121.000.

Schuder, Maurice E.; and Stafford, Richard W., to Emhart Industries, Inc. Timing mechanism with two separate programs operating separate switch actuators and having an alarm system. 4,412,750., Cl. 368-98.000.

Schulte, Eric F.: *See*—
McKee, William R.; Murdock, Russell H.; and Schulte, Eric F., 4,413,020., Cl. 427-53.100.

Schultz, Ronald E.; Veres, Jonathan S.; and German, Mark J., to Allen-Bradley Company. Programmable controller for executing block transfer with remote I/O interface racks. 4,413,319., Cl. 364-200.000.

Schultz, Thomas, to Siemens Aktiengesellschaft. Outdoor high voltage circuit breaker. 4,413,165., Cl. 200-148.00H.

Schulz, Friedemann J. Automatic control device. 4,413,190., Cl. 307-241.000.

Schulz-Walz, Hansjochen: *See*—
Hess, Bernhard; Schulz-Walz, Hansjochen; von Harpe, Hannes; Peltzer, Bernd; and Bottenbruch, Ludwig, 4,413,072., Cl. 523-500.000.

Schummer, Helmut: *See*—
Donig, Gerhard; Schmidt, Walter; Schummer, Helmut; and Neulinger, Franz, 4,413,225., Cl. 323-246.000.

Schurter, Rolf: *See*—
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,412,856., Cl. 71-121.000.

Schwartz, Richard S.: *See*—
Lundblad, John L.; Budinger, Miriam D.; and Schwartz, Richard S., 4,412,990., Cl. 424-177.000.

Schwarz, Rudolf: *See—*
Fuchs, Gottfried; Garrecht, Ewald; Rieck, Lothar; Ruppel, Wolfgang; Schwarz, Rudolf; and Siegle, Erich, 4,412,641., Cl. 228-37.000.

Scola, Daniel A., to United Technologies Corporation. Adhesive bonding method employing diene bis-imide polymers. 4,412,884., Cl. 156-307.300.

Scott, Douglas W.: *See—*
Kling, John E.; Camin, Larry R.; and Scott, Douglas W., 4,412,832., Cl. 604-164.000.

Seibel, David D.: *See—*
Gerlach, Robert L.; Seibel, David D.; and Miller, Mark C., 4,412,771., Cl. 414-217.000.

Seidaliev, Fikrat S. O.: *See—*
Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438., Cl. 72-10.000.

Sekiguchi, Takashi: *See—*
Yamaguchi, Hiroshi; Sekiguchi, Takashi; Tsukahara, Hideyuki; Negishi, Nobumasa; and Fujita, Kisuke, 4,412,809., Cl. 431-76.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,412,882., Cl. 156-188.000.

Selenia, Industrie Elettroniche Associate, S.p.A.: *See—*
Basini, Bruno, 4,413,163., Cl. 179-175.30R.

Selleri, Narciso, to Finike Italiana Marposs S.p.A. Gauge for checking features - like linear dimensions - of a mechanical piece. 4,412,385., Cl. 33-178.00E.

Sengoku, Ikuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and a device for fixing a window molding onto a windowpane. 4,412,406., Cl. 52-208.000.

Sensormatic Electronics Corporation: *See—*
Pinneo, George G.; and Weaver, Jon N., 4,413,254., Cl. 340-572.000.

Seprosy Societe Europeenne pour la Transformation des Produits de Synthese: *See—*
Guerrazzi, Vincent; and Vendramini, Valerio, 4,412,633., Cl. 222-468.000.

Seton Company: *See—*
Cioca, Gheorghe, 4,412,947., Cl. 260-123.700.

Shafer, David R., to Perkin-Elmer Corporation, The. Optical system for correcting the aberrations of a beamsplitter in converging light. 4,412,723., Cl. 350-171.000.

Shahani, Chandru M., to Klenzaids Engineers Private Limited. Method and apparatus for control of gas-borne particulates. 4,412,849., Cl. 55-97.000.

Shallenberger, Fred T., Jr., to Metal Cutting Tools, Inc. Drill with single cutter. 4,412,763., Cl. 408-224.000.

Shanbrom, Edward. Depyrogenation process. 4,412,985., Cl. 424-78.000.

Shandala, Frank: *See—*
McCrudden, Edward; and Shandala, Frank, 4,412,599., Cl. 182-201.000.

Shapiro, Eugene: *See—*
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,412,871., Cl. 148-2.000.

Sharashkin, Andrei M.: *See—*
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201., Cl. 310-260.000.

Sharp Kabushiki Kaisha: *See—*
Yasuda, Shuhei; Koyanagi, Katsubumi; Ishii, Yutaka; and Wada, Tomio, 4,413,256., Cl. 340-784.000.

Shaw, David N.; and First, David J., to Durham-Bush, Inc. Control system for screw compressor. 4,412,788., Cl. 417-280.000.

Sheffield, Ellis W.: *See—*
Sheppard, Douglas B.; Kezerle, James A.; and Sheffield, Ellis W., 4,412,808., Cl. 431-8.000.

Shell Oil Company: *See—*
Dye, Robert F., 4,412,887., Cl. 159-47.100.
Fisch, Edwin J., 4,412,977., Cl. 423-226.000.

Sheppard, Douglas B.; Kezerle, James A.; and Sheffield, Ellis W., to TRW Inc. Dual fueled burner gun. 4,412,808., Cl. 431-8.000.

Sherno, Stanley A., to Aperm of South Carolina. Method for weatherproofing substrates. 4,413,026., Cl. 427-407.100.

Shibata, Akira, to Chugai Denki Kogyo K.K. Electrical contact materials of internally oxidized Ag-Sn-Bi alloy. 4,412,971., Cl. 420-501.000.

Shibayama, Yuho: *See—*
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, 4,412,810., Cl. 431-186.000.

Shibuya, Kunihiro; and Iwata, Yasuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrophotographic copier with copy paper supply device. 4,412,734., Cl. 355-3.0SH.

Shibuya, Tsunenori: *See—*
Kondo, Hiroshi; and Shibuya, Tsunenori, 4,412,787., Cl. 417-269.000.

Shima, Takaharu: *See—*
Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187., Cl. 250-491.100.

Shimada, Akira: *See—*
Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285., Cl. 358-260.000.

Shimada, Hidetoshi: *See—*
Kurashige, Tomozo; and Shimada, Hidetoshi, 4,412,864., Cl. 106-235.000.

Shimada, Keizo; Mera, Hiroshi; Sasaki, Noriaki; and Aoki, Akihiro, to Teijin Limited. Aromatic copolyamide containing 3,4'-diphenylene moiety. 4,413,114., Cl. 528-183.000.

Shimada, Takeo: *See—*
Isaka, Tsutomu; Ishioka, Mitsugu; Shimada, Takeo; and Inoue, Takayuki, 4,413,066., Cl. 521-149.000.

Shimazaki, Kenji: *See—*
Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, 4,412,937., Cl. 502-423.000.

Shimizu, Takashi: *See—*
Morimoto, Hisao; Inai, Toshimi; and Shimizu, Takashi, 4,412,882., Cl. 156-188.000.

Shimomoto, Yasuharu: *See—*
Tanaka, Yasuo; Sasano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, 4,412,900., Cl. 204-192.00P.

Shin-Etsu Chemical Co., Ltd.: *See—*
Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiro, 4,412,886., Cl. 156-645.000.

Shinada, Kazuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing semiconductor device utilizing selective masking, etching and oxidation. 4,412,378., Cl. 29-578.000.

Shinano, Tomoyuki: *See—*
Izuha, Akira; Shinano, Tomoyuki; Shibayama, Yuho; Kurata, Chikatoshi; and Fujii, Kenichi, 4,412,810., Cl. 431-186.000.

Shinohara, Koji: *See—*
Fukuda, Hirokazu; Shinohara, Koji; and Itou, Mitiharu, 4,413,343., Cl. 372-44.000.

Shintomi, Keiichi: *See—*
Kanno, Takeshi; Gaino, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keiichi, 4,413,006., Cl. 424-250.000.

Shipley, Randall S.; and Freyer, Larry E., to Dow Chemical Company, The. Reaction products of transition metal compounds and boron compounds and catalysts prepared therefrom. 4,412,939., Cl. 502-115.000.

Shirahata, Ryuji: *See—*
Kitamoto, Tatsuji; and Shirahata, Ryuji, 4,412,507., Cl. 118-718.000.

Shoji, Masuhiro; Sakagami, Teruo; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Cyanoethylated olefin-vinyl alcohol copolymer and dielectric material and adhesive comprising the same. 4,413,090., Cl. 525-59.000.

Showalter, Thomas A., to Spectrum Design Co. Programmable electronic time and tide clock. 4,412,749., Cl. 368-19.000.

Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., to Stern Electronics, Inc. Remote-control system for coin-operated phonographs. 4,413,260., Cl. 340-825.250.

Siegel, Wolfgang: *See—*
Wohnhas, Norbert; and Siegel, Wolfgang, 4,412,748., Cl. 366-341.000.

Siegle, Erich: *See—*
Fuchs, Gottfried; Garrecht, Ewald; Rieck, Lothar; Ruppel, Wolfgang; Schwarz, Rudolf; and Siegle, Erich, 4,412,641., Cl. 228-37.000.

Siemens Aktiengesellschaft: *See—*
Bonu, Bonu, 4,412,504., Cl. 118-664.000.
Chaillie, Charles; and Reisinger, Konrad, 4,413,336., Cl. 370-48.000.
Donig, Gerhard; Schmidt, Walter; Schummer, Helmut; and Neulinger, Franz, 4,413,225., Cl. 323-246.000.
Feuerbaum, Hans-Peter, 4,413,181., Cl. 250-310.000.
Plaettner, Rolf; and Kruehler, Wolfgang, 4,412,935., Cl. 252-188.100.
Saatze, Kuno, 4,412,721., Cl. 350-96.200.
Schultz, Thomas, 4,413,165., Cl. 200-148.00H.
Stein, Karl-Ulrich, 4,412,741., Cl. 356-1.000.

Siemon, Rolf W.: *See—*
Porter, Ronald G.; LeBlanc, Richard E.; and Siemon, Rolf W., 4,413,250., Cl. 340-310.00A.

Sifferman, Thomas R., to Conoco Inc. Methods of inhibiting the flow of water in subterranean formations. 4,412,586., Cl. 166-294.000.

Sigl, Wayne C., to Kimberly-Clark Corporation. Method and apparatus for manufacturing elastic leg disposable diapers. 4,412,881., Cl. 156-164.000.

Silbernagel, Hermann. Sign holder with reversible supporting brackets. 4,412,396., Cl. 40-607.000.

Sillion, Bernard: *See—*
Damin, Bernard; Forestiere, Alain; and Sillion, Bernard, 4,413,133., Cl. 549-265.000.

Silva, John C., Jr. Evaporative carburetor and engine. 4,412,521., Cl. 123-522.000.

Silvia, Denis A., to United States of America, Navy. Explosive logic safing device. 4,412,493., Cl. 102-275.900.

Simak, Petr: *See—*
Naarmann, Herbert; Penzien, Klaus; Schlag, Johannes; and Simak, Petr, 4,412,942., Cl. 252-518.000.

Simmering-Graz-Pauker AG: *See—*
Obermayer, Bertram; Greier, Josef; and Mandl, Walter, 4,412,513., Cl. 123-55.0VE.

Simonson, Jorgen R. Drawer slide system. 4,412,703., Cl. 308-3.600.

Simpson, Dennis W.: *See—*
Slater, Billy R.; Simpson, Dennis W.; and Carroll, Clarence T., 4,413,314., Cl. 364-188.000.

Sinclair, Alvin R.; and Gleason, Edward H., to Polysar International S.A. Hard shell soft core latex. 4,413,068., Cl. 523-201.000.

Singer Company, The: *See—*
Adams, Kenneth D., 4,413,310., Cl. 362-90.000.
Brown, Jack, 4,413,214., Cl. 318-488.000.
McGavin, Hubert P., 4,412,462., Cl. 76-5.00R.
Obermann, George; and Mateja, Edward J., 4,413,164., Cl. 200-38.00R.

Singh, Baldev, to Sterling Drug Inc. Preparation of 1,2-dihydro-6-(lower alkyl)-2-oxo-5-(pyridinyl)nicotinonitriles. 4,413,127., Cl. 546-249.000.

Sinha, Vijay K.: *See—*
Wallace, William E.; Sinha, Vijay K.; and Purarian, Faiz, 4,412,982., Cl. 423-644.000.

Sircar, Ila; and Holmes, Ann, to Warner-Lambert Company. Substituted 2,2-dimethyl-5-phenoxypentanoic acid benzamides as anti-arteriosclerotic agents and method. 4,413,011., Cl. 424-309.000.

Sjusin, Gennady A.: *See—*
Tjushevsky, Vladimir M.; Ermakov, Vladimir E.; Seidaliev, Fikrat S. O.; Sjusin, Gennady A.; Dobkin, Igor I.; and Krasovsky, Jury V., 4,412,438., Cl. 72-10.000.

Skaletz, Detlef H.: *See—*
Fischer, Hartmut; and Skaletz, Detlef H., 4,413,149., Cl. 568-636.000.

SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,412,372., Cl. 29-149.50R.

Skinner, Dale D.: *See—*
Rowe, Linwood M., Jr.; Skinner, Dale D.; and Thompson, John H., 4,413,331., Cl. 367-151.000.

Skoch, Leroy V.; and Pike, Keith E., to Ralston Purina Company. Pellet die. 4,413,016., Cl. 426-454.000.

Skutskars Rostfria AB: *See—*
Fundell, Bo W., 4,412,401., Cl. 51-103.00R.

SKW Trostberg: *See—*
Doliwa, Ernst J.; Reifferscheid, Karl J.; and Wolfsgruber, Friedrich, 4,412,578., Cl. 164-349.000.

Slater, Billy R.; Simpson, Dennis W.; and Carroll, Clarence T., to Forney Engineering Company. Industrial process control system. 4,413,314., Cl. 364-188.000.

Sloan, Kenneth B.; and Little, Roy, to INTERx Research Corporation. Mannich-base hydroxamic acid prodrugs, compositions and use. 4,412,994., Cl. 424-248.530.

Slomma, Heinz-Georg: *See—*
Teetz, Wolfgang; Slomma, Heinz-Georg; and Ripkens, Hans-Gerd, 4,412,497., Cl. 112-96.000.

Smidt, Donald L.: *See—*
Houghton, Timothy J.; Szwargulski, Carl J., Jr.; Bentrup, Jerry A.; and Smidt, Donald L., 4,412,627., Cl. 220-66.000.

Smith, E. Quimby, Jr., to Q Corporation. Engine operated by a non-polluting recyclable fuel. 4,412,421., Cl. 60-643.000.

Smith, George F., Jr., to Hergeth, Incorporated. Horizontal baling apparatus and method. 4,412,410., Cl. 53-528.000.

Smith, Jerry R., to Innovative Research Corporation. Rekeyable lock method and apparatus. 4,412,437., Cl. 70-338.000.

Smith Kline & French Laboratories Limited: *See—*
White, George R., 4,413,130., Cl. 548-342.000.

Smith, Paul P.: *See—*
Cheary, Clifford M.; Lancaster, David J.; and Smith, Paul P., 4,413,303., Cl. 361-253.000.

Smyser, Michael A.: *See—*
Foster, George B.; Gibbs, Paul D.; and Smyser, Michael A., 4,413,322., Cl. 364-448.000.

Sochor, Josef, to Robert Bosch GmbH. Circuit for deriving a timing signal from digital imput signals. 4,413,236., Cl. 331-25.000.

S.A. Automobiles Citroen: *See—*
Barthelemy, Andre J., 4,412,460., Cl. 74-752.00E.

Societe Anonyme dite: Alsthom-Atlantique: *See—*
Combes, Gilles, 4,412,555., Cl. 137-524.000.

Societe Anonyme dite: Les Cables de Lyon: *See—*
Guazzo, Lucien, 4,412,878., Cl. 156-91.000.

Societe Anonyme Francaise du Ferodo: *See—*
Loizeau, Pierre, 4,412,606., Cl. 192-106.200.

Societe Centrale de l'Uranium et des Minerais et Metaux Radioactifs Scumra: *See—*
Capitani, Enzo; and Teissie, Jean, 4,412,923., Cl. 210-661.000.

Societe Chimique des Charbonnages: *See—*
Lemattre, Maurice; Roussel, Robert; and Wirth, Rene, 4,412,896., Cl. 204-159.200.

Societe Chimique des Charbonnages-CdF Chimie: *See—*
Haas, Armand, 4,413,109., Cl. 526-348.000.

Societe dite Automobiles Peugeot: *See—*
Barthelemy, Andre J., 4,412,460., Cl. 74-752.00E.

Societe Fracaise d'Equipements pour la Navigation Aerienne S.F.E.N.A.: *See—*
Lebrun, Jean L., 4,413,321., Cl. 364-428.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See—*
Legrand, Paul J.; Notheaux, Andre R.; Pachomoff, Guy R.; and Romanoff, Alexis M. G., 4,412,774., Cl. 414-589.000.

Soeda, Takashi: *See—*
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005., Cl. 424-285.000.

Soeishi, Yoshiaki: *See—*
Kawata, Hiroitsu; Ohmura, Tadayoshi; Yano, Katsuhiko; Matsumura, Mikio; Higuchi, Saburo; and Soeishi, Yoshiaki, 4,412,986., Cl. 424-80.000.

Softky, Edward H.: *See—*
Lutz, Michael A.; Kroymann, Howard B.; Tayeb, Abdul M.; and Softky, Edward H., 4,413,259., Cl. 340-825.060.

Sogo Pharmaceutical Company, Ltd.: *See—*
Uchikuga, Saburo; Tashiro, Tomoyasu; and Osawa, Yasuko, 4,413,129., Cl. 548-342.000.

Sokolowski, James H., to Upjohn Company, The. Method of treating pseudopregnancy, galactorrhea and mastitis in mammals. 4,412,993., Cl. 424-243.000.

Soldaev, Lev K.: *See—*
Khmelkov, Stanislav F.; Ramazanov, Mnaidar R.; Soldatov, Mikhail P.; Beskaravainy, Vadim V.; Aranovich, Viktor L.; and Soldaev, Lev K., 4,412,936., Cl. 252-408.100.

Soldatov, Mikhail P.: *See—*
Khmelkov, Stanislav F.; Ramazanov, Mnaidar R.; Soldatov, Mikhail P.; Beskaravainy, Vadim V.; Aranovich, Viktor L.; and Soldaev, Lev K., 4,412,936., Cl. 252-408.100.

Soma, Nobuo; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, to Sankyo Company Ltd. Polyalkylpiperdine side chain stabilizers for synthetic polymer compositions. 4,413,076., Cl. 524-102.000.

Sony Corporation: *See—*
Baba, Yasuharu, 4,413,237., Cl. 331-108.00C.
Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuo; Doi, Toshitada; and Vries, Lodewijk B., 4,413,340., Cl. 371-39.000.
Takahashi, Toshio; and Ohsawa, Mitsuo, 4,413,309., Cl. 361-406.000.

Soper, William G., to United States of America, Navy. Impulse warhead. 4,412,494., Cl. 102-491.000.

Sorelec: *See—*
Leroy, Claude, 4,412,430., Cl. 62-467.00R.

Sorensen, Robert; Barrett, Edward A.; and Scarnato, Thomas J., to International Harvester Co. Self-regulating air inlet. 4,412,761., Cl. 406-98.000.

Southwire Company: *See—*
Chadwick, Kenneth E.; Chia, E. Henry; Ogletree, Robert H.; Powers, Frank M.; and Richardson, Larry S., 4,412,580., Cl. 164-433.000.

Sowers, Edward E.; Goe, Gerald L.; and Prunier, Michael L., to Reilly Tar & Chemical Corp. Polymer composition and process for preparing same. 4,413,099., Cl. 525-327.100.

Spadini, Gianfranco L.: *See—*
Chung, Stanley Y.; and Spadini, Gianfranco L., 4,412,934., Cl. 252-186.380.

Sparks, Daniel R., to Becton Dickinson and Company. Space bar for low profile keyboards. 4,412,754., Cl. 400-496.000.

Spectrum Design Co.: *See—*
Showalter, Thomas A., 4,412,749., Cl. 368-19.000.

Speigel, Kenneth, to North American Philips Consumer Electronics Corp. Cathode-G1 spacing material and method of application. 4,413,203., Cl. 313-446.000.

Speirs, Graeme K. Clamps. 4,412,370., Cl. 24-268.000.

Spellicy, Robert L., to OptiMetrics, Inc. Resonant spectrophone system noise elimination. 4,412,445., Cl. 73-24.000.

Spencer, Dudley W. C., to Du Pont de Nemours, E. I., and Company. Sterile docking process, apparatus and system. 4,412,835., Cl. 604-29.000.

Sperry Corporation: *See—*
Josephs, Richard M.; and Wang, Tsing-Chow, 4,413,196., Cl. 307-462.000.
Josephs, Richard M.; and Wang, Tsing-Chow, 4,413,197., Cl. 307-462.000.
Rowland-Hill, E. William, 4,412,549., Cl. 130-27.00T.
Swenson, Robert E., 4,413,317., Cl. 364-200.000.

Spracklen, John E.: *See—*
Quick, Roy F., Jr.; and Spracklen, John E., 4,413,258., Cl. 340-825.500.

Sprague Electric Company: *See—*
Gontowski, Walter S., Jr.; and Mayrand, James F., 4,413,271., Cl. 357-40.000.

Sprague, Robert A., to Xerox Corporation. Multigate light valve for electro-optic line printers having non-telecentric imaging systems. 4,413,270., Cl. 346-160.000.

Sprecker, Mark A.: *See—*
Hall, John B.; and Sprecker, Mark A., 4,413,139., Cl. 560-126.000.

Springer, Paul H., to Newey Goodman Limited. Safety-pins. 4,412,368., Cl. 24-158.000.

SRI International: *See—*
Weaver, Charles S.; and Chadwick, Joseph H., 4,413,289., Cl. 360-51.000.

Sridhar, Bettadapur N. Nuclear reactor control apparatus. 4,412,968., Cl. 376-233.000.

Staberoh, Uwe: *See—*
Schreiner, Friedrich; and Staberoh, Uwe, 4,412,705., Cl. 308-178.000.

Staerzl, Richard E., to Brunswick Corporation. Low fuel pressure monitor for internal combustion engine. 4,413,248., Cl. 340-52.00R.

Staeubli Ltd.: *See—*
Kleiner, Walter, 4,412,563., Cl. 139-66.00R.

Stafford, Richard W.: *See—*
Schuder, Maurice E.; and Stafford, Richard W., 4,412,750., Cl. 368-98.000.

Stake Technology Limited: *See—*
Brown, Douglas B., 4,412,485., Cl. 100-117.000.
Standard Oil Company, The: *See—*
Dolhyj, Serge R.; Velenyi, Louis J.; and Guttmann, Andrew T., 4,412,847., Cl. 44-77.000.
Suresh, Dev D.; Grasselli, Robert K.; and Orndoff, David A., 4,413,155., Cl. 585-417.000.
Standard Oil Company (Indiana): *See—*
Moote, Truman P.; Dunton, Myron L.; McGalliard, Russell L.; and Yarborough, Lyman, 4,412,913., Cl. 208-207.000.
Nimry, Tayseer S.; and Fields, Ellis K., 4,413,115., Cl. 528-189.000.
Standard Products Company, The: *See—*
Brenner, Walter, 4,413,019., Cl. 427-36.000.
Stanley Works, The: *See—*
Suska, Charles R., 4,412,711., Cl. 339-4.000.
Stauber, Ronald C.: *See—*
Kulin, Ralph; Moncrief, Jack W.; Popovich, Robert P.; and Stauber, Ronald C., 4,412,834., Cl. 604-29.000.
Stauffer Chemical Company: *See—*
Abramson, Alan; Ciomo, George C.; Davis, Gershon J.; and Weil, Edward D., 4,412,956., Cl. 260-429.00R.
Wong, Rayman Y., 4,412,997., Cl. 424-263.000.
Stefancik, Nikolaus: *See—*
Galow, Manfred; and Stefancik, Nikolaus, 4,412,770., Cl. 414-162.000.
Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Method for the automatic or semiautomatic distance measurement and focusing of the image of an object onto a focal plane. 4,412,741., Cl. 356-1.000.
Steinleitner, Gunther; and Haar, Wilhelm, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,413,043., Cl. 429-104.000.
Stenberg, Kaj O.; and Nystrom, Lars H., to Cambro Lundia AB. Pump including locking means for a flexible tube. 4,412,793., Cl. 417-477.000.
Stephens, Geoffrey B.: *See—*
De Bar, David E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,412,376., Cl. 29-576.00B.
Sterling Drug Inc.: *See—*
Bell, Malcolm R.; and Herrmann, John L., Jr., 4,412,995., Cl. 424-251.000.
Crounse, Nathan N., 4,412,950., Cl. 260-157.000.
Singh, Baldev, 4,413,127., Cl. 546-249.000.
Stern Electronics, Inc.: *See—*
Siegel, Lawrence; Polanek, Edward L.; Miller, Anthony J.; and Woodman, Alan L., 4,413,260., Cl. 340-825.250.
Stier, Glenn R.; and Mizrachi, Moshe, to Norlin Industries, Inc. Synchronization system for an electronic musical instrument having plural automatic play features. 4,412,471., Cl. 84-1.030.
Stoeckigt, Dieter: *See—*
Klahr, Erhard; Trieselt, Wolfgang; Balzer, Wolf-Dieter; Strickler, Rainer; and Stoeckigt, Dieter, 4,412,933., Cl. 252-174.190.
Stoehr, Herbert M., to Artos Engineering Company. Roller forming machine with lengthwise adjustable heads. 4,412,443., Cl. 72-181.000.
Stoewe, Anneliese: *See—*
Forberg, Horst; Achtnig, Klaus-Peter; and Stoewe, Anneliese, 4,412,374., Cl. 29-566.400.
Stokely-Van Camp, Inc.: *See—*
Ertle, Raymond T., 4,412,978., Cl. 423-279.000.
Stoltman, Donald: *See—*
Hoch, Martin M.; and Stoltman, Donald, 4,412,519., Cl. 123-449.000.
Stone, Louis P.: *See—*
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,412,871., Cl. 148-2.000.
Stonehill, Bernard C.: *See—*
White, James H.; Stonehill, Bernard C.; Johnston, Brian F.; Perrin, Albert R.; and Guthrie, Roderick I. L., 4,412,815., Cl. 432-206.000.
Stoudt, Thomas H.: *See—*
Carlo, Dennis J.; Nollstadt, Karl H.; Stoudt, Thomas H.; and Maigetter, Robert Z., 4,413,057., Cl. 435-101.000.
Strain, David H.; and Sutton, John H., III, to Beckman Instruments, Inc. Cover for centrifuge rotor. 4,412,830., Cl. 494-12.000.
Strand, Rolf: *See—*
Claesson, Kjell; Ronnerholm, Stig; and Strand, Rolf, 4,412,649., Cl. 236-46.00R.
Streich, Steven G.; Nickles, R. Benton; and Treece, Harold O., to Halliburton Company. Dog locking sleeve. 4,412,559., Cl. 138-89.000.
Stricker, C. Donald: *See—*
Bakewell, Frank W.; Nicely, Thomas E.; and Stricker, C. Donald, 4,412,503., Cl. 118-420.000.
Strickler, Rainer: *See—*
Klahr, Erhard; Trieselt, Wolfgang; Balzer, Wolf-Dieter; Strickler, Rainer; and Stoeckigt, Dieter, 4,412,933., Cl. 252-174.190.
Strul, Bruno: *See—*
Macovski, Albert; Strul, Bruno; and Alvarez, Robert E., 4,413,353., Cl. 378-062.000.
Stumpf, Harry C.: *See—*
Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,412,869., Cl. 148-2.000.
Vernam, William D.; Rogers, Ralph W., Jr.; and Stumpf, Harry C., 4,412,870., Cl. 148-2.000.
Sturdivant, Jack E. Dental mouth mirror. 4,412,821., Cl. 433-30.000.
Sugier, Andre: *See—*
Audibert, Francois; Sugier, Andre; and Van Landeghem, Hugo, 4,413,063., Cl. 518-700.000.
Sugiyama, Akira; and Hirota, Kunio, to Brother Kogyo Kabushiki Kaisha. Apparatus for attaching a plurality of studs on flexible sheet material. 4,412,640., Cl. 227-85.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus capable of performing automatic search reproduction. 4,413,292., Cl. 360-72.200.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. State indicating device in a rotary recording medium reproducing apparatus. 4,413,299., Cl. 360-137.000.
Sugiyama, Mituo: *See—*
Takahashi, Masatoshi; Sugiyama, Mituo; Toisawa, Osamu; and Ishizaki, Yasuo, 4,412,945., Cl. 252-551.000.
Sullivan, Robert P.: *See—*
Perry, Glenn M.; and Sullivan, Robert P., 4,412,510., Cl. 122-510.000.
Sulzer Brothers Limited: *See—*
Tiefenthaler, Edelbert, 4,412,671., Cl. 251-31.000.
Sumi, Hideji; and Kokado, Masayuki, to Fujitsu Limited. Line driver circuit having a protective circuit against excess currents. 4,413,300., Cl. 361-98.000.
Sumitomo Chemical Company, Limited: *See—*
Omura, Takashi; Tezuka, Yasuo; and Sunami, Masaki, 4,412,948., Cl. 260-153.000.
Sumitomo Electric Industries, Ltd.: *See—*
Tsuji, Kazuo; Yazu, Shuji; and Hara, Akio, 4,412,980., Cl. 423-446.000.
Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
Tatsuwaki, Masao; Nemoto, Shin; and Okuhara, Seiichi, 4,413,324., Cl. 364-557.000.
Sun Chemical Corporation: *See—*
Lupoli, Peter J., 4,413,234., Cl. 324-435.000.
Sun Electric Corporation: *See—*
Ketel, William E., II, 4,412,444., Cl. 73-23.000.
Sunami, Masaki: *See—*
Omura, Takashi; Tezuka, Yasuo; and Sunami, Masaki, 4,412,948., Cl. 260-153.000.
Sundstrand Data Control, Inc.: *See—*
Muller, Hans R., 4,413,323., Cl. 364-521.000.
Sunpower, Inc.: *See—*
Beale, William T., 4,412,418., Cl. 60-520.000.
Suntola, Tuomo S.; Pakkala, Arto J.; and Lindfors, Sven G., to Canon Kabushiki Kaisha. Method for performing growth of compound thin films. 4,413,022., Cl. 427-255.200.
Suresh, Dev D.; Grasselli, Robert K.; and Orndoff, David A., to Standard Oil Co., The. Ammoxidation of olefins with novel antimonate catalysts. 4,413,155., Cl. 585-417.000.
Suska, Charles R., to Stanley Works, The. Two knuckle electrical hinge. 4,412,711., Cl. 339-4.000.
Sutoh, Shinji: *See—*
Iida, Katumi; Sutoh, Shinji; and Hara, Toshizo, 4,412,424., Cl. 62-209.000.
Sutton, John H., III: *See—*
Strain, David H.; and Sutton, John H., III, 4,412,830., Cl. 494-12.000.
Suzuki, Hajime: *See—*
Kobayashi, Takeshi; and Suzuki, Hajime, 4,412,562., Cl. 139-54.000.
Suzuki, Sadao: *See—*
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,412,966., Cl. 264-521.000.
Suzuki, Tadashi: *See—*
Ito, Takuzo; Suzuki, Tadashi; and Miyake, Tatsuro, 4,412,600., Cl. 187-17.000.
Suzuki, Yoichi: *See—*
Ohyaba, Takashi; and Suzuki, Yoichi, 4,413,160., Cl. 179-115.00V.
Suzuki, Yoshiaki: *See—*
Kageyama, Takao; Suzuki, Yoshiaki; and Watanabe, Eiichi, 4,413,207., Cl. 315-5.520.
Swalwell, John E.: *See—*
Gibson, David V.; Parr, Rodney W.; and Swalwell, John E., 4,413,073., Cl. 523-511.000.
Sweeney, William M.: *See—*
Kaufman, Benjamin J.; and Sweeney, William M., 4,412,845., Cl. 44-53.000.
Swenson, Robert E., to Sperry Corporation. Multiprocessor system with cache/disk subsystem with status routing for plural disk drives. 4,413,317., Cl. 364-200.000.
Swern, Frederic L.: *See—*
Brandau, William E.; Swern, Frederic L.; and Moses, Kurt, 4,413,320., Cl. 364-428.000.
Szamek, Pierre E. Recreational skate. 4,412,685., Cl. 280-11.190.
Szczepanski, Henry: *See—*
Brunner, Hans-Georg; Schurter, Rolf; and Szczepanski, Henry, 4,412,856., Cl. 71-121.000.
Szwargulski, Carl J., Jr.: *See—*
Houghton, Timothy J.; Szwargulski, Carl J., Jr.; Bentrup, Jerry A.; and Smidt, Donald L., 4,412,627., Cl. 220-66.000.
Szymaszek, Jan W.: *See—*
Huseby, Irvin C.; Szymaszek, Jan W.; and Heft, Eldon B., 4,413,062., Cl. 501-123.000.
Tachihara, Satoru; and Okudaira, Sadao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Rear stop diaphragm zoom lens. 4,412,725., Cl. 350-426.000.

Tadauchi, Masaharu: *See*—
Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285., Cl. 358-260.000.
Taguchi, Kenichi: *See*—
Sakaguchi, Susumu; Taguchi, Kenichi; Iguchi, Masaaki; and Ito, Kunihiro, 4,412,886., Cl. 156-645.000.
Taira, Akio, to Olympus Optical Company Ltd. Optical system for tiltable lens barrel of a microscope. 4,412,727., Cl. 350-514.000.
Taira, Toshiju, to Nippondenso Co., Ltd. Structure for supporting automobile horn. 4,412,593., Cl. 180-68.00P.
Takada, Takuzo: *See*—
Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, 4,412,966., Cl. 264-521.000.
Takagi, Mikio; and Kamioka, Hajime, to Fujitsu Limited. Method for drying semiconductor substrates. 4,412,388., Cl. 34-1.000.
Takahashi, Eiji: *See*—
Nagai, Nobuyuki; Takahashi, Eiji; Matsumoto, Yoji; and Ohtsu, Hideaki, 4,412,453., Cl. 73-601.000.
Takahashi, Harumi: *See*—
Ogata, Yoshihiro; Abe, Yoshihiro; and Takahashi, Harumi, 4,412,732., Cl. 355-3.0TR.
Takahashi, Hiroyoshi: *See*—
Ohtawa, Kimiaki; Takahashi, Hiroyoshi; and Fukada, Yasuo, 4,412,674., Cl. 266-91.000.
Takahashi, Masatoshi; Sugiyama, Mituo; Toisawa, Osamu; and Ishizaki, Yasuo, to Lion Corporation. Aqueous high concentration slurry of alcohol ethoxylate. 4,412,945., Cl. 252-551.000.
Takahashi, Sadao: *See*—
Koyama, Shuntaro; Miyamoto, Tomohiko; Tanaka, Shinji; Miyadera, Hiroshi; and Takahashi, Sadao, 4,412,848., Cl. 48-197.00R.
Takahashi, Toshio; and Ohsawa, Mitsuo, to Sony Corporation. Printed circuit board. 4,413,309., Cl. 361-406.000.
Takao, Hisashi: *See*—
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005., Cl. 424-285.000.
Takara Kogyo Co., Ltd.: *See*—
Ueda, Yoshihiko, 4,412,919., Cl. 210-189.000.
Takeda Chemical Industries, Ltd.: *See*—
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, 4,413,102., Cl. 525-453.000.
Tanaka, Nobuyoshi, 4,412,624., Cl. 215-100.00A.
Takeda, Sunao: *See*—
Okino, Haruka; Ogawa, Keitkitsu; Takeda, Sunao; Mohri, Hiromichi; and Hiraide, Shigeru, 4,412,545., Cl. 128-691.000.
Takekoshi, Yasuaki: *See*—
Hanyu, Yoshiyuki; and Takekoshi, Yasuaki, 4,412,669., Cl. 251-4.000.
Takemae, Yoshihiro: *See*—
Mochizuki, Hirohiko; Nakano, Masao; Baba, Fumio; Nakano, Tomio; and Takemae, Yoshihiro, 4,413,272., Cl. 357-65.000.
Takemoto, Iwao: *See*—
Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,413,283., Cl. 358-213.000.
Takenaka, Hisataka: *See*—
Michikami, Osamu; Katoh, Yujiro; Tanabe, Keiichi; Takenaka, Hisataka; and Yoshii, Shizuka, 4,412,902., Cl. 204-192.00E.
Takenouchi, Mutsuo: *See*—
Ozawa, Takashi; and Takenouchi, Mutsuo, 4,413,188., Cl. 250-578.000.
Takeuchi, Shigeru: *See*—
Sakaguchi, Keizo; and Takeuchi, Shigeru, 4,412,561., Cl. 138-174.000.
Takizuka, Michinori: *See*—
Hasegawa, Kunio; and Takizuka, Michinori, 4,412,875., Cl. 149-19.900.
Talres Development (N.A.) N.V.: *See*—
van der Loo, Henricus E.; and Wiener, Charles, 4,412,984., Cl. 424-58.000.
Tanabe, Keiichi: *See*—
Michikami, Osamu; Katoh, Yujiro; Tanabe, Keiichi; Takenaka, Hisataka; and Yoshii, Shizuka, 4,412,902., Cl. 204-192.00E.
Tanabe Seiyaku Co., Ltd.: *See*—
Kanno, Takeshi; Gaino, Mitsunori; Yamamura, Michio; Ishida, Ryuichi; and Shintomi, Keiichi, 4,413,006., Cl. 424-250.000.
Tanaka, Akira: *See*—
Goto, Takeshi; Takao, Hisashi; Soeda, Takashi; Asai, Nobuyoshi; Iida, Sadahiko; Kawata, Mitsuyasu; Osaki, Norio; Yasudomi, Norio; Murata, Tadateru; and Tanaka, Akira, 4,413,005., Cl. 424-285.000.
Tanaka, Masataka: *See*—
Nagashima, Kenji; Matsumoto, Hiroshi; Tanaka, Masataka; Oodaira, Hirosi; and Iwase, Nobuo, 4,412,377., Cl. 29-577.00C.
Tanaka, Michio; Nasu, Kohji; and Kanemoto, Tetsuaki, to Takeda Chemical Industries, Ltd. Composition for protecting cementware from frost-damage comprising urethane resin and organopolysiloxane. 4,413,102., Cl. 525-453.000.
Tanaka, Motoharu; Machida, Hazime; and Kobayashi, Hiroshi, to Ricoh Company, Ltd. Magnetic recording and playback apparatus of perpendicular recording type. 4,413,297., Cl. 360-119.000.
Tanaka, Nobuyoshi, to Takeda Chemical Industries, Ltd. Hanging member for hanging a container in an inverted position. 4,412,624., Cl. 215-100.00A.
Tanaka, Shinichiro: *See*—
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,412,517., Cl. 123-339.000.
Tanaka, Shinji: *See*—
Koyama, Shuntaro; Miyamoto, Tomohiko; Tanaka, Shinji; Miyadera, Hiroshi; and Takahashi, Sadao, 4,412,848., Cl. 48-197.00R.
Tanaka, Yasuo; Satano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, to Hitachi, Ltd. Method of manufacturing photosensors. 4,412,900., Cl. 204-192.00P.
Tanaka, Yuji: *See*—
Akazawa, Yuji; Osada, Toshihiko; Shima, Takaharu; Tanaka, Yuji; and Hattori, Masayuki, 4,413,187., Cl. 250-491.100.
Tanimura, Tomihisa: *See*—
Abe, Akira; and Tanimura, Tomihisa, 4,412,399., Cl. 46-47.000.
Tanno, Kiyohiko: *See*—
Anzai, Masayasu; Tanno, Kiyohiko; Hirane, Hideo; Shimada, Akira; and Tadauchi, Masaharu, 4,413,285., Cl. 358-260.000.
Tano, Kazuhiro: *See*—
Higuchi, Seizun; Kamada, Minoru; Tano, Kazuhiro; Fushino, Tetsuo; and Fujinaga, Minoru, 4,413,039., Cl. 428-643.000.
Tanzawa, Misao: *See*—
Sakamoto, Koji; and Tanzawa, Misao, 4,412,736., Cl. 355-15.000.
Tappe, Horst; and Wille, Herbert, to Cassella Aktiengesellschaft. 4-Isopropyl-4'-nitrobenzophenone and a process for the preparation of 4'-nitrobenzophenones substituted in the 4-position. 4,413,144., Cl. 568-306.000.
Tashiro, Tomoyasu: *See*—
Uchikuga, Saburo; Tashiro, Tomoyasu; and Osawa, Yasuko, 4,413,129., Cl. 548-342.000.
Tatsuwaki, Masao; Nemoto, Shin; and Okuhara, Seiichi, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Temperature pattern measuring method and a device therefor. 4,413,324., Cl. 364-557.000.
Taureg, Herbert: *See*—
Petrzelka, Miloslav; and Taureg, Herbert, 4,412,827., Cl. 464-128.000.
Tayeb, Abdul M.: *See*—
Lutz, Michael A.; Kroymann, Howard B.; Tayeb, Abdul M.; and Softky, Edward H., 4,413,259., Cl. 340-825.060.
Taylor, David W., to Ergon, Inc. Coal treatment process. 4,412,839., Cl. 44-1.00B.
Taylor, Noel R.; and Taylor, Paul A., to CMD Enterprise, Inc. Automatic load seeking control for a multitorque motor. 4,413,218., Cl. 318-771.000.
Taylor, Paul A.: *See*—
Taylor, Noel R.; and Taylor, Paul A., 4,413,218., Cl. 318-771.000.
Taylor, Robin: *See*—
Ducharme, Ronald L.; and Taylor, Robin, 4,413,219., Cl. 320-15.000.
Teccor Electronics, Inc.: *See*—
Crockett, Charles R., 4,413,193., Cl. 307-311.000.
Teetz, Wolfgang; Slomma, Heinz-Georg; and Ripkens, Hans-Gerd, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Apparatus for driving thread levers on embroidery machines. 4,412,497., Cl. 112-96.000.
Teich, Wesley W., to Raytheon Company. Heating time coupling factor for microwave oven. 4,413,168., Cl. 219-10.55B.
Teijin Limited: *See*—
Shimada, Keizo; Mera, Hiroshi; Sasaki, Noriaki; and Aoki, Akihiro, 4,413,114., Cl. 528-183.000.
Teissie, Jean: *See*—
Capitani, Enzo; and Teissie, Jean, 4,412,923., Cl. 210-661.000.
Teitscheid, Heinz-Horst: *See*—
Weyde, Edith; von Rintelen, Harald; Saleck, Wilhelm; and Teitscheid, Heinz-Horst, 4,413,055., Cl. 430-567.000.
Temple, Chester S., to PPG Industries, Inc. Storage stable polyolefin compatible non-crosslinking size for fiber glass strands. 4,413,085., Cl. 524-321.000.
Teren, Dorothy R. Remotely controlled massaging apparatus. 4,412,535., Cl. 128-57.000.
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Terlizzi, Nicholas, Jr.; and Terlizzi, Donald, 4,412,393., Cl. 36-113.000.
Terlizzi, Nicholas, Jr.; and Terlizzi, Donald, to Ballet Makers, Inc. Ballet toe shoe and process of manufactare thereof. 4,412,393., Cl. 36-113.000.
Tesch, Gunter; and Gieldanowski, Siegfried, to Breveteam S.A. Fiber aggregate. 4,413,030., Cl. 428-85.000.
Texaco Inc.: *See*—
Kaufman, Benjamin J.; and Sweeney, William M., 4,412,845., Cl. 44-53.000.
Nieh, Edward C. Y.; Naylor, Carter G.; and Lambert, Clifford L., 4,412,926., Cl. 252-8.55D.
Watts, Lewis W., Jr.; and Marquis, Edward T., 4,413,156., Cl. 585-254.000.
Texas Instruments Incorporated: *See*—
McKee, William R.; Murdock, Russell H.; and Schulte, Eric F., 4,413,020., Cl. 427-53.100.
Robinson, Jeffrey L., 4,413,313., Cl. 363-80.000.
Ting, Youn H., 4,413,174., Cl. 219-511.000.
Tezuka, Yasuo: *See*—
Omura, Takashi; Tezuka, Yasuo; and Sunami, Masaki, 4,412,948., Cl. 260-153.000.
Thermo King Corporation: *See*—
Barlass, John W., 4,412,783., Cl. 416-186.00A.
Thermoguard Insulation Co.: *See*—
Crawford, Roger; and Sanders, Duane, 4,412,659., Cl. 241-35.000.

Thoma, Endre P., to International Business Machines Corporation. Dynamic memory cell. 4,413,329., Cl. 365-189.000.

Thomas, Alan V.; and Bone, Geoffrey E., to British Aerospace Public Limited Company. Fluid supply systems. 4,412,419., Cl. 60-634.000.

Thomas, Lowell E., to Dynamics Research Corporation. Method for providing high resolution, highly defined, thick film patterns. 4,413,051., Cl. 430-312.000.

Thompson, Donald R.; and Vogliano, Robert H., to Goodyear Tire & Rubber Company, The. Method of making an air spring. 4,412,965., Cl. 264-257.000.

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Rowe, Linwood M., Jr.; Skinner, Dale D.; and Thompson, John H., 4,413,331., Cl. 367-151.000.

Thomsen, Svend E.; and Kyster, Erik, to Danfoss A/S. Hydrostatic steering gear. 4,412,415., Cl. 60-384.000.

Thomson, Adam R., to Ewesplint Limited. Method for splinting animal teeth. 4,412,818., Cl. 433-1.000.

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Bitoune, Sylviane; Dufond, Pierre; Herrbach, Francois; and Lecreff, Maurice, 4,413,241., Cl. 333-22.00R.
Morizot, Jean Paul, 4,413,208., Cl. 315-39.300.
Val, Christian; and Pribat, Didier, 4,413,170., Cl. 219-216.000.

Thonnart, Paul, to Ateliers de Constructions Electriques de Charleroi. Method for simultaneous teletext and analog signal transmission. 4,413,281., Cl. 358-147.000.

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Flavan, David B., Jr.; Jenkins, Merrill M. E., Sr.; White, James S.; and Pate, James E., 4,412,610., Cl. 198-403.000.

Thubeauville, Heinz, to Dr. C. Otto & Comp. G.m.b.H. Coke oven battery for production of coke and gas. 4,412,890., Cl. 202-139.000.

Tiefenthaler, Edelbert, to Sulzer Brothers Limited. Plate valve. 4,412,671., Cl. 251-31.000.

Tiger, Howard L. Fresh air breathing mask with exterior heat exchanger. 4,412,537., Cl. 128-204.170.

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Morningstar, Leroy J.; and Tighe, Charles, Jr., 4,412,714., Cl. 339-91.00R.

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Huffnagle, Clifton W.; Morningstar, LeRoy J.; and Tighe, Charles L., Jr., 4,412,566., Cl. 140-147.000.

Tihon, Claude; and Curry, M. Elaine, to Bristol-Myers Company. Apparatus for preparing single cell suspension. 4,413,059., Cl. 435-286.000.

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Kadykov, Vladimir A.; Onischin, Boris P.; Ermakov, Gennady P.; Linev, Valery D.; Khristoforov, Viktor P.; Burochkin, Alexandr E.; Mittsev, Sergei G.; Timofeev, Gennady A.; Keller, Viktor R.; Mikshin, Viktor P.; and Grodinsky, Grigory I., 4,412,857., Cl. 75-11.000.

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Todd, David B.; and Layfield, James D., to Baker Perkins Inc. Centrifugal pelletizing systems and process. 4,412,964., Cl. 264-143.000.

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Ikegami, Shigeru; Hirai, Minoru; Izumi, Kazuo; and Shimazaki, Kenji, 4,412,937., Cl. 502-423.000.

Toisawa, Osamu: *See*—
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Tokarz, Richard D. Medical entry connector for teeth bearing animals. 4,412,825., Cl. 433-229.000.

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Ohtomo, Fumio; and Kimura, Kazuaki, 4,412,745., Cl. 356-373.000.

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Iwasaki, Hidenori; Urata, Yukio; and Kasukawa, Shunichi, 4,413,091., Cl. 525-61.000.

Tokyo Rope Manufacturing Co., Ltd.: *See*—
Hara, Hiromasa, 4,412,474., Cl. 87-6.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Baba, Masaharu; and Honda, Kiyokazu, 4,412,716., Cl. 339-176.00L.
Hashimoto, Yoshiro; and Horino, Shigeo, 4,412,411., Cl. 53-587.000.
Nagashima, Kenji; Matsumoto, Hiroshi; Tanaka, Masataka; Oodaira, Hirosi; and Iwase, Nobuo, 4,412,377., Cl. 29-577.00C.
Nishio, Kohsaku, 4,413,352., Cl. 378-42.000.
Oota, Hiroyuki; and Narita, Ryuuho, 4,412,481., Cl. 99-280.000.
Shibuya, Kunihiro; and Iwata, Yasuhiro, 4,412,734., Cl. 355-3.0SH.
Shinada, Kazuyoshi, 4,412,378., Cl. 29-578.000.
Tsunoda, Sachio; and Sato, Shinsaku, 4,412,779., Cl. 415-1.000.

Tomabechi, Hideo, to Olympus Optical Co., Ltd. Pinch pressure-adjusting device for a pair of pinch rollers used with dual capstan type tape-running apparatus. 4,412,638., Cl. 226-190.000.

Tomlinson, Jerry G.: *See*—
Novick, Allen S.; Tomlinson, Jerry G.; and Troth, Dennis L., 4,412,414., Cl. 60-39.230.

Tomy Kogyo Co., Inc.: *See*—
Abe, Akira; and Tanimura, Tomihisa, 4,412,399., Cl. 46-47.000.

Toro Company, The: *See*—
White, Donald M., III, 4,412,382., Cl. 30-276.000.

Torpie, John D.; Lozen, Robert F.; and Hsieh, Shing-Chang R., to Xerox Corporation. White line skipping. 4,413,287., Cl. 358-288.000.

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Claesson, Kjell; Ronnerholm, Stig; and Strand, Rolf, 4,412,649., Cl. 236-46.00R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kobashi, Mamoru; Tanaka, Shinichiro; and Saji, Hideo, 4,412,517., Cl. 123-339.000.
Mitsuyasu, Masaki; Aoki, Keiji; and Nakatomi, Takayoshi, 4,412,520., Cl. 123-488.000.
Sengoku, Ikuo, 4,412,406., Cl. 52-208.000.

Tracor Hydronautics, Incorporated: *See*—
Dementhon, Daniel, 4,412,417., Cl. 60-497.000.

Transequip Limited: *See*—
Dunwoodie, Edward H.; and Elston, Ronald W., 4,412,756., Cl. 403-363.000.

Transpec, Inc.: *See*—
Manning, Donald L., 4,412,404., Cl. 52-19.000.

Treece, Harold O.: *See*—
Streich, Steven G.; Nickles, R. Benton; and Treece, Harold O., 4,412,559., Cl. 138-89.000.

Trhlik, Jaromir: *See*—
Pudil, Frantisek; and Trhlik, Jaromir, 4,412,596., Cl. 180-227.000.

Trieselt, Wolfgang: *See*—
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Trindle, Terry L.: *See*—
Prokop, B. Robert; and Trindle, Terry L., 4,412,690., Cl. 280-718.000.

Trisa Burstenfabrik AG: *See*—
Fischer, Franz, 4,413,199., Cl. 310-50.000.

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Novick, Allen S.; Tomlinson, Jerry G.; and Troth, Dennis L., 4,412,414., Cl. 60-39.230.

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TRW Inc.: *See*—
Sheppard, Douglas B.; Kezerle, James A.; and Sheffield, Ellis W., 4,412,808., Cl. 431-8.000.

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Kolbanovsky, July A.; Tsagareli, Romeo V.; and Schipachev, Viktor S., 4,412,552., Cl. 137-14.000.

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Chemla, Daniel S.; Oudar, Jean-Louis; and Tsoucaris, Georges, 4,413,128., Cl. 546-312.000.

Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, to Nippon Oil Company, Limited. Novel hydrogenated resin produced from five-member cyclic compounds having a conjugated double bond and/or diels-alder addition products thereof. 4,413,067., Cl. 523-172.000.

Tsuji, Kazuo; Yazu, Shuji; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Method for producing a diamond sintered compact. 4,412,980., Cl. 423-446.000.

Tsukada, Toshihisa: *See*—
Tanaka, Yasuo; Sasano, Akira; Tsukada, Toshihisa; and Shimomoto, Yasuharu, 4,412,900., Cl. 204-192.00P.

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Yamaguchi, Hiroshi; Sekiguchi, Takashi; Tsukahara, Hideyuki; Negishi, Nobumasa; and Fujita, Kisuke, 4,412,809., Cl. 431-76.000.

Tsukata, Masaharu; and Murakami, Koichi, to Canon Kabushiki Kaisha. Image formation apparatus. 4,412,735., Cl. 355-14.00R.

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Tucker, Jasper J. Interlocking building structure. 4,412,405., Cl. 52-86.000.

Tummala, Rao R.: *See*—
Kumar, Ananda H.; McMillan, Peter W.; and Tummala, Rao R., 4,413,061., Cl. 501-7.000.

Turco Manufacturing Co.: *See*—
Baynes, William R., 4,412,678., Cl. 272-123.000.

Turner, Hilton A., Jr., to General Motors Corporation. Electrical harness analyzer. 4,413,228., Cl. 324-51.000.

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Young, Kevin L.; and Turner, Jesse H., 4,412,650., Cl. 236-48.00A.

Turutin, Veniamin S.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201., Cl. 310-260.000.

Tyler, Derek E.: *See*—
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,412,871., Cl. 148-2.000.

Tyler, Hugh J.; and Conway, William H., to Robertshaw Controls Company. Capacitive switch and panel. 4,413,252., Cl. 340-365.00C.

Uchida, Akinari: *See*—
Fujie, Kunio; Uchida, Akinari; and Abe, Kazuhiko, 4,412,527., Cl. 126-400.000.

Uchikuga, Saburo; Tashiro, Tomoyasu; and Osawa, Yasuko, to Sogo Pharmaceutical Company, Ltd. Process for preparing the H_2-receptor antagonist cimetidine. 4,413,129., Cl. 548-342.000.

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Ertl, Dietrich; and Ueberle, Dieter, 4,412,838., Cl. 23-302.00R.

Ueda, Yoshihiko, to Takara Kogyo Co., Ltd., a part interest. Water purification device. 4,412,919., Cl. 210-189.000.

Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, to Pioneer Electronic Corporation. Cassette tape player-recorder. 4,413,291., Cl. 360-71.000.

Uema, Kenyu, to Fujitsu Limited. Method for detecting a position of a micro-mark on a substrate by using an electron beam. 4,413,186., Cl. 250-491.100.

Ulmes, James J.: *See*—
Phalin, Thomas L.; and Ulmes, James J., 4,412,440., Cl. 72-46.000.

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Huizinga, Donald D.; Means, Donald R.; and Underhill, Edward W., 4,413,159., Cl. 179-90.00K.

Uni-Cardan AG: *See*—
Petrzelka, Miloslav; and Taureg, Herbert, 4,412,827., Cl. 464-128.000.

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Conte, Louis B., Jr.; and Reichle, Walter T., 4,413,123., Cl. 544-215.000.
D'Silva, Themistocles D. J., 4,413,007., Cl. 424-298.000.
Leung, Pak S.; and Cacciola, Anthony R., 4,412,921., Cl. 210-500.200.

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Holstedt, Richard A.; and Jessup, Peter, 4,412,928., Cl. 252-46.400.

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Army: *See*—
Bennet, John G., 4,412,386., Cl. 33-268.000.
Chen, Edward S.; and Baldauf, William, 4,412,892., Cl. 204-34.000.
Durenec, Peter, 4,412,423., Cl. 62-6.000.
Horn, Stuart B.; McMillion, Lundy H.; Dunmire, Howard L.; Sawyer, Geoffrey S.; and Gerkin, William C., 4,412,427., Cl. 62-298.000.
Huskins, Chester W.; and Williams, Leroy J., 4,412,874., Cl. 149-19.200.
Ney, Robert J.; and Hafner, Erich, 4,412,508., Cl. 118-726.000.
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Noonan, Kevin W., 4,412,664., Cl. 244-35.00R.
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Gilmour, George A., 4,413,332., Cl. 367-123.000.
Lenko, Daniel S., 4,412,387., Cl. 33-361.000.
Marrone, Michael J., 4,413,184., Cl. 250-368.000.
Romeo, Donald E.; and McIver, George W., 4,413,239., Cl. 332-16.00T.
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Silvia, Denis A., 4,412,493., Cl. 102-275.900.
Soper, William G., 4,412,494., Cl. 102-491.000.

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Bentin, Horst, 4,413,268., Cl. 346-140.00R.
Hartl, Walter, 4,413,356., Cl. 378-132.000.
Kowalski, Gunter, 4,413,351., Cl. 378-19.000.
Ooms, Leo F. M., 4,413,205., Cl. 313-579.000.

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Bakewell, Frank W.; Nicely, Thomas E.; and Stricker, C. Donald, 4,412,503., Cl. 118-420.000.

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Jarvik, Robert K., 4,412,539., Cl. 128-325.000.

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Layden, George K., 4,412,854., Cl. 65-18.100.
Monsarrat, William G., 4,412,782., Cl. 415-175.000.
Salkeld, Richard W.; Anderson, Neal P.; and Giamei, Anthony F., 4,412,577., Cl. 164-122.200.
Scola, Daniel A., 4,412,884., Cl. 156-307.300.

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Yates, Wesley E.; Cowden, Robert E.; Akesson, Norman B.; and Horgan, Paul M., 4,412,654., Cl. 239-171.000.

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Mourou, Gerard A.; and Knox, Wayne H., 4,413,178., Cl. 250-213.0VT.

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Kummel, Friedrich; Hennecke, Rudolf; and Schubert, Manfred, 4,412,757., Cl. 404-113.000.

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Arena, Blaise J., 4,413,152., Cl. 568-863.000.
Asdigian, George, 4,412,912., Cl. 208-206.000.
Briggs, Bruce A., 4,413,150., Cl. 568-697.000.

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Rizzo, Victor L., 4,413,013., Cl. 424-321.000.
Sokolowski, James H., 4,412,993., Cl. 424-243.000.
Walker, Jerry A.; and Hessler, Edward J., 4,412,955., Cl. 260-397.450.
Wierenga, Wendell, 4,413,132., Cl. 548-491.000.

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Iwasaki, Hidenori; Urata, Yukio; and Kasukawa, Shunichi, 4,413,091., Cl. 525-61.000.

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Matsuura, Kazuo; Yamaoka, Noboru; Yanahashi, Shinichi; Usui, Katumi; and Miyoshi, Mituji, 4,413,097., Cl. 525-240.000.

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Komatsu, Tatsuyoshi; and Usui, Kenji, 4,412,954., Cl. 260-369.000.

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Lewis, Elyse B.; and Valdiserri, Leo L., 4,413,078., Cl. 524-120.000.

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Fiorini, Mario; and Valentini, Claudio, 4,413,142., Cl. 562-567.000.

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Kaspar, Arthur H.; Valis, Johnny J.; Aschenbeck, Weldon J.; Kaspar, Josephine A.; and Kaspar, Don G., 4,412,608., Cl. 194-4.00D.

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Ballerini, Daniel; Chaude, Odile; Chauveteau, Guy; Kohler, Norbert; and Vandecastele, Jean-Paul, 4,412,925., Cl. 252-8.55D.

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Audibert, Francois; Sugier, Andre; and Van Landeghem, Hugo, 4,413,063., Cl. 518-700.000.

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Guerrazzi, Vincent; and Vendramini, Valerio, 4,412,633., Cl. 222-468.000.

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Du Broff, William; Craig, George H.; and Veslocki, Timothy A., 4,412,841., Cl. 44-10.00C.

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Goto, Kunio, 4,413,334., Cl. 369-126.000.
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Thompson, Donald R.; and Vogliano, Robert H., 4,412,965., Cl. 264-257.000.

Vogt, Susi: *See*—
Hardtmann, Goetz E.; Repic, Oljan; and Vogt, Susi, 4,412,952., Cl. 260-239.30D.

von Alfthan, Georg C.: *See*—
Uusitalo, Seppo J.; von Alfthan, Georg C.; Andersson, Tor S.; Paukku, Vaino A.; Kahara, Lasse S.; and Kiuru, Erkki S., 4,412,451., Cl. 73-432.0PS.

von Harpe, Hannes: *See*—
Hess, Bernhard; Schulz-Walz, Hansjochen; von Harpe, Hannes; Peltzer, Bernd; and Bottenbruch, Ludwig, 4,413,072., Cl. 523-500.000.

von Rintelen, Harald: *See*—
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Vosburgh, Kirby G.: *See*—
Brown, Dale M.; and Vosburgh, Kirby G., 4,412,868., Cl. 148-1.500.

Vosburgh, William G., to Du Pont de Nemours, E. I., and Company. Embossing secondary backings of carpets. 4,412,877., Cl. 156-72.000.

Voss, Fern E.: *See*—
Voss, Herman; and Voss, Fern E., 4,412,652., Cl. 237-16.000.

Voss, Herman; and Voss, Fern E. Economizer for building heating systems. 4,412,652., Cl. 237-16.000.

Vries, Lodewijk B.: *See*—
Odaka, Kentaro; Sako, Yoichiro; Iwamoto, Ikuo; Doi, Toshitada; and Vries, Lodewijk B., 4,413,340., Cl. 371-39.000.

W. R. Grace & Co.: *See*—
Hegedus, Louis, 4,413,041., Cl. 429-33.000.

Wacker-Chemie GmbH: *See*—
Deubzer, Bernward; Egerter, Norbert; and Frey, Volker, 4,413,104., Cl. 525-479.000.

Wackerle, Peter-Martin; and Hahn, Michael, to Messerschmitt-Boelkow-Blohm GmbH. Monocoque type rotor blade. 4,412,784., Cl. 416-230.000.

Wada, Tomio: *See*—
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Waeschle Maschinenfabrik GmbH: *See*—
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Waldrep, Henry D. Automotive air conditioner expansion tube unit. 4,412,431., Cl. 62-511.000.

Walker, Jerry A.; and Hessler, Edward J., to Upjohn Company, The. Preparation of corticoids from 17-keto steroids. 4,412,955., Cl. 260-397.450.

Wallace, Steven A.; Creech, Edward T.; and Northcutt, Walter G. Process for recovering niobium from uranium-niobium alloys. 4,412,860., Cl. 75-84.000.

Wallace, William E.; Sinha, Vijay K.; and Purarian, Faiz, to Koppers Company, Inc. Zirconium-titanium-manganese-iron alloy characterized by $ZrMn_2$ stoichiometry. 4,412,982., Cl. 423-644.000.

Walter, Lothar: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,412,372., Cl. 29-149.50R.

Wang, David N.; Egitto, Frank D.; and Maydan, Dan, to Applied Materials, Inc. Materials and methods for plasma etching of aluminum and aluminum alloys. 4,412,885., Cl. 156-643.000.

Wang, Tsing-Chow: *See*—
Josephs, Richard M.; and Wang, Tsing-Chow, 4,413,196., Cl. 307-462.000.
Josephs, Richard M.; and Wang, Tsing-Chow, 4,413,197., Cl. 307-462.000.

Waratah General Engineering Ltd.: *See*—
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Wargo, Robert A., to RCA Corporation. Television ghost signal detection during the video information interval. 4,413,282., Cl. 358-167.000.

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Watanabe, Kenkichi; and Hata, Setsuo, to Laurel Bank Machine Co., Ltd. Coin accumulator assembly. 4,412,550., Cl. 133-8.00A.

Watanabe, Yasuo: *See*—
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Watts, Lewis W., Jr.; and Marquis, Edward T., to Texaco Inc. Manufacture of synthetic lubricant additives from low molecular weight olefins using boron trifluoride catalysts. 4,413,156., Cl. 585-254.000.

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Wawrzyniak, Walter W. Double ended tap. 4,412,764., Cl. 408-226.000.

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Weaver, Jon N.: *See*—
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Webster, Francis, to Quaker Oats Company, The. Method for preparing whole grain oat product. 4,413,018., Cl. 426-618.000.

Webster, John E., Jr. Heating unit. 4,412,651., Cl. 237-1.00R.

Wegner, Christian; Jabs, Gert; and Dahm, Manfred, to Bayer Aktiengesellschaft. Process for the production of microcapsules. 4,412,959., Cl. 264-4.100.

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White, Donald M., III, to Toro Company, The. Line feed mechanism for filament cutting. 4,412,382., Cl. 30-276.000.

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Whitney, Floyd A., to Born Free Plastics, Inc. Thermoplastic drum apparatus. 4,412,628., Cl. 220-71.000.

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Wierenga, Wendell, to Upjohn Company, The. Antibiotic CC-1065 indoline intermediates. 4,413,132., Cl. 548-491.000.

Wilding, Edwin; and DeVere, James W., to Griffin & Company, Inc. Control apparatus and method for dumping tobacco. 4,412,773., Cl. 414-403.000.

Wilhelm, Donald F.; and Moser, Robert L., to Helm Instrument Company, Inc. Load sensing probe. 4,412,456., Cl. 73-862.650.

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Williams, Donald E. Appliance for a book or the like. 4,412,692., Cl. 281-34.000.

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Williams, Paul M., to Williams Sound Corporation. Multicompartment equipment case and cover. 4,412,616., Cl. 206-333.000.

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Wilson, Troy K.; and Handly, Robert J., to Honeywell Inc. Floating point division control. 4,413,326., Cl. 364-748.000.

Windsor, Harry M., to Automotive Products Limited. Rotary transmission electronic control system providing automatic changes of speed ratio. 4,412,461., Cl. 74-866.000.

Winter, Roland A. E.: *See*—
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Winterberg, Friedwardt M. Multistage high voltage accelerator for intense charged particle beams. 4,412,967., Cl. 376-106.000.

Wintermantel, Erich. Process for producing hollow profiled structures, and structures produced thereby. 4,412,880., Cl. 156-156.000.

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Wistuba, Eckehardt, to BASF Aktiengesellschaft. Preparation of aqueous epoxy resin dispersions, and their use. 4,413,071., Cl. 523-411.000.

Witschard, Gilbert, to Occidental Chemical Corporation. Vinyl halide polymer blends of enhanced impact resistance. 4,413,092., Cl. 525-71.000.

Witte, Willi; and Boing, Wulf, to Dr. Boing GmbH & Co. Anlagen und Maschinen KG. Apparatus for the dyeing and fixing of knitted articles of clothing. 4,412,434., Cl. 68-3.00R.

Wohnhas, Norbert; and Siegel, Wolfgang, to Waeschle Maschinenfabrik GmbH. Gravity circulation mixer. 4,412,748., Cl. 366-341.000.

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Wrasidlo, Wolfgang J.; and Mysels, Karol J., to Brunswick Corporation. Hydrophilic surfaces and process for making the same. 4,413,074., Cl. 524-43.000.

Wright, Lawrence B., to Lamb Technicon Corp. Tool compensator. 4,412,465., Cl. 82-1.200.

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Sprague, Robert A., 4,413,270., Cl. 346-160.000.
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Yamashita, Kunihiko; and Kimura, Muneaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for thermal hydrocracking of coal. 4,412,908., Cl. 208-8.00R.

Yamauchi, Toshima; Nogami, Sadao; Sawada, Kengi; Moriya, Jyunichiro; Sawada, Hiroomi; and Kobayashi, Keizou, to Kabushiki Kaisha Kurio-Medikaru. Apparatus for refrigeration treatment. 4,412,538., Cl. 128-303.100.

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Yasuda, Shuhei; Koyanagi, Katsubumi; Ishii, Yutaka; and Wada, Tomio, to Sharp Kabushiki Kaisha. Driving method for display panels. 4,413,256., Cl. 340-784.000.

Yasudomi, Norio: *See*—
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Yates, Wesley E.; Cowden, Robert E.; Akesson, Norman B.; and Horgan, Paul M., to University of California, The Regents of the. Laminar microjet atomizer and method of aerial spraying of liquids. 4,412,654., Cl. 239-171.000.

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Yoneda, Ryuichi: *See*—
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York, Stuart A., to Continental Group, Inc., The. Offset flow injection nozzle. 4,412,807., Cl. 425-564.000.

Yoshida, Kazutaka: *See*—
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Yoshihara, Kenji: *See*—
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Yoshino Kogyosho Co., Ltd.: *See*—
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Yoshino, Yataro; Suzuki, Sadao; and Takada, Takuzo, to Yoshino Kogyosho Co., Ltd. Neck orienting method of bottles of saturated polyester resins. 4,412,966., Cl. 264-521.000.

Yoshioka, Takao: *See*—
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Yoshizawa, Tadao: *See*—
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Young, Hugh M.: *See*—
Jones, William A.; and Young, Hugh M., 4,412,826., Cl. 440-86.000.

Young, Kevin L.; and Turner, Jesse H., to Essex Group, Inc. Snap acting heat motor operated gas valve. 4,412,650., Cl. 236-48.00A.

Young, Sze-Teh: *See*—
Herborn, Peter E.; Liu, Thomas T.; and Young, Sze-Teh, 4,412,731., Cl. 354-299.000.

Yuan, Shao W. Wiser cooling system. 4,412,426., Cl. 62-260.000.

Yundt, George B.; and Curtiss, William P., to Charles Stark Draper Laboratory, Inc., The. Induction generator frequency control system. 4,413,223., Cl. 322-32.000.

Yusa, Yasuhiro: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,292., Cl. 360-72.200.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,413,299., Cl. 360-137.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Schreiner, Friedrich; and Staberoh, Uwe, 4,412,705., Cl. 308-178.000.

Zalisz, Rene; and Salles, Marie-France, to Roussel Uclaf. Immunostimulating glycoproteins. 4,412,946., Cl. 260-112.00R.

Zander, Patricia J. Child-proof pill container for handicapped. 4,412,625., Cl. 215-223.000.

Zavodszky, Tamas, to Koppers Company, Inc. Apparatus for handling a continuous casting machine starter bar. 4,412,579., Cl. 164-413.000.

Zdeb, Brian D., to Baxter Travenol Laboratories, Inc. Injection site. 4,412,573., Cl. 604-415.000.

Zelins, Ronald P., to Western Electric Company, Incorporated. Feeder guide. 4,412,672., Cl. 254-134.30R.

Zitz, Alfred; Droscher, Erich; and Schetina, Otto, to Voest-Alpine Aktiengesellschaft. System for monitoring the movement of a cutting tool of a tunnel-driving machine relative to a desired profile. 4,412,700., Cl. 299-1.000.

Zolotov, Lev A.: *See*—
Nikitin, Pavel Z.; Danilevich, Yanush B.; Maslennikov, Konstantin N.; Potekhin, Konstantin F.; Zolotov, Lev A.; Turutin, Veniamin S.; Nemeni, Tibor M.; Nikolsky, Alexandr I.; Kabanov, Pavel S.; Bezchastnov, Gennady A.; and Sharashkin, Andrei M., 4,413,201., Cl. 310-260.000.

Zorn, Thomas E. Floating arcade. 4,412,680., Cl. 273-85.00H.

Zurfluh, Rene, to Hoffmann-La Roche Inc. Carbamic acid esters and use as pesticides. 4,413,010., Cl. 424-300.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF NOVEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Arvey Corporation: *See*—
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Boonstra, Alexander H.; Mutsaers, Cornelis A. H. A.; and van der Kruijs, Franciscus N. G. R., to U.S. Philips Corporation. Resistance material. Re. 31,437., Cl. 338-308.000.

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Wisco Industries, Inc.: *See*—
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Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., to Wood Manufacturing Company, Incorporated. Boat. 271,192., 11-1-83, Cl. D12-300.000.
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., to Wood Manufacturing Company, Incorporated. Boat. 271,193., 11-1-83, Cl. D12-300.000.
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Wood Manufacturing Company, Incorporated: *See*—
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,192., Cl. D12-300.000.
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,193., Cl. D12-300.000.
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,194., Cl. D12-300.000.
Wood, Mickey C.: *See*—
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,192., Cl. D12-300.000.
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,193., Cl. D12-300.000.
Wood, Forrest L.; Wood, Mickey C.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 271,194., Cl. D12-300.000.
Zarn, Inc.: *See*—
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Zimmerman, Valentine J.; Abel, Mary H.; and Rubbelke, Lloyd J., to E. E. Industries Inc. Playground climber. 271,228., 11-1-83, Cl. D21-245.000.
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Weeks, O. L. Rose plant. 5,130., 11-1-83, Cl. 18.000.

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APPLICANTS TO WHOM

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Baugher, Jeffrey S.; Oehlbeck, Douglas L.; and Brown, Barry M. Process and apparatus for preparing silver halide emulsions. T103,603., 11-1-83, Cl. 430-569.000.

Brown, Barry M.: *See*—
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CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 1, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

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528	4,412,410
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CLASS 100

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CLASS 110

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313	4,412,498

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270	4,412,501

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664	4,412,504
674	4,412,505
683	4,412,506
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510	4,412,510

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	4,412,516
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488	4,412,520
522	4,412,521
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417	4,412,528
419	4,412,529

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66	4,412,867

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20	4,412,532
33	4,412,533
52	4,412,534
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303.1	4,412,538
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419 PG	4,412,541
422	4,412,540
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633	4,412,543
660	4,412,544
691	4,412,545
709	4,412,546
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CLASS 133

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CLASS 134

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CLASS 137

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118	4,412,553
375	4,412,554
524	4,412,555
614.11	4,412,556
624.13	4,412,557

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174	4,412,561

CLASS 139

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CLASS 140

92.1	4,412,564
123	4,412,565
147	4,412,566

CLASS 141

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392	4,412,568

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CLASS 145

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	4,412,870
	4,412,871
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91	4,412,878
145	4,412,879
156	4,412,880
164	4,412,881
188	4,412,882
222	4,412,883
307.3	4,412,884
643	4,412,885
645	4,412,886

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47.1	4,412,887

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CLASS 164

122.2	4,412,577
349	4,412,578
413	4,412,579
433	4,412,580

CLASS 165

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76	4,412,582
95	4,412,583

CLASS 166

169	4,412,584
248	4,412,585
294	4,412,586

CLASS 172

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CLASS 175

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CLASS 177

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211	4,412,595
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228	4,412,597

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201	4,412,599

CLASS 187

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CLASS 188

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CLASS 190

1	4,412,604

CLASS 192

82 T	4,412,605
106.2	4,412,606

CLASS 194

1 D	4,412,607
4 D	4,412,608

CLASS 198

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403	4,412,610
450	4,412,611
697	4,412,612

CLASS 200

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248	4,412,891

CLASS 204

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105 R	4,412,893
119	4,412,894
129	4,412,895
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	4,412,903
192 E	4,412,902
192 P	4,412,900
192 R	4,412,899
298	4,412,905
	4,412,906
	4,412,907
424	4,412,904

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	4,412,614
319	4,412,615
333	4,412,616
339	4,412,617
581	4,412,618
611	4,412,619

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11 R	4,412,909
	4,412,910
121	4,412,911
206	4,412,912
207	4,412,913
253	4,412,914
311	4,412,915

CLASS 209

3.1	4,412,620

CLASS 210

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104	4,412,917
169	4,412,918
189	4,412,919
409	4,412,920
500.2	4,412,921
638	4,412,922
661	4,412,923
744	4,412,924

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CLASS 212

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CLASS 215

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400 4,413,171
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412 4,413,173
511 4,413,174

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CLASS 366

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341 4,412,748

CLASS 367

123 4,413,332
151 4,413,331

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	4,412,780	39 :	4,412,380		4,413,081		4,413,035		4,412,977		4,412,792
	4,412,822		4,412,384		4,413,140		4,413,064		4,413,020		4,412,881
	4,412,845		4,412,395		4,413,158		4,413,068		4,413,034		4,412,909
	4,412,868		4,412,416	41 :	4,412,405		4,413,085		4,413,156		4,413,215
	4,412,892		4,412,418		4,412,558		4,413,086		4,413,182		4,413,248
	4,412,920		4,412,456								

DESIGN PATENTS

6 :	271,216		271,180	09 :	271,158		271,196		271,222		271,201
9 :	271,215		271,181	12 :	271,164		271,239	37 :	271,247		271,230
01 :	271,179		271,189		271,221	26 :	271,191	39 :	271,160	51 :	271,161
04 :	271,235		271,206		271,227	27 :	271,232		271,223		271,173
05 :	271,192		271,210	13 :	271,204	29 :	271,157	40 :	271,184		271,236
	271,193		271,211		271,205		271,231	42 :	271,155		271,248
	271,194		271,217	17 :	271,168	33 :	271,238		271,185	53 :	271,183
06 :	271,154		271,226		271,225	36 :	271,159		271,237		271,219
	271,156		271,229		271,233		271,163	44 :	271,182	54 :	271,162
	271,166		271,246	18 :	271,197		271,209	47 :	271,172	55 :	271,175
	271,167	08 :	271,171	25 :	271,174		271,220	48 :	271,177		271,228
	271,169										

PLANT PATENTS

06 :	5,130	39 :	5,131		5,132						

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09 :	T103,601	36 :	T103,603	42 :	T103,602						

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